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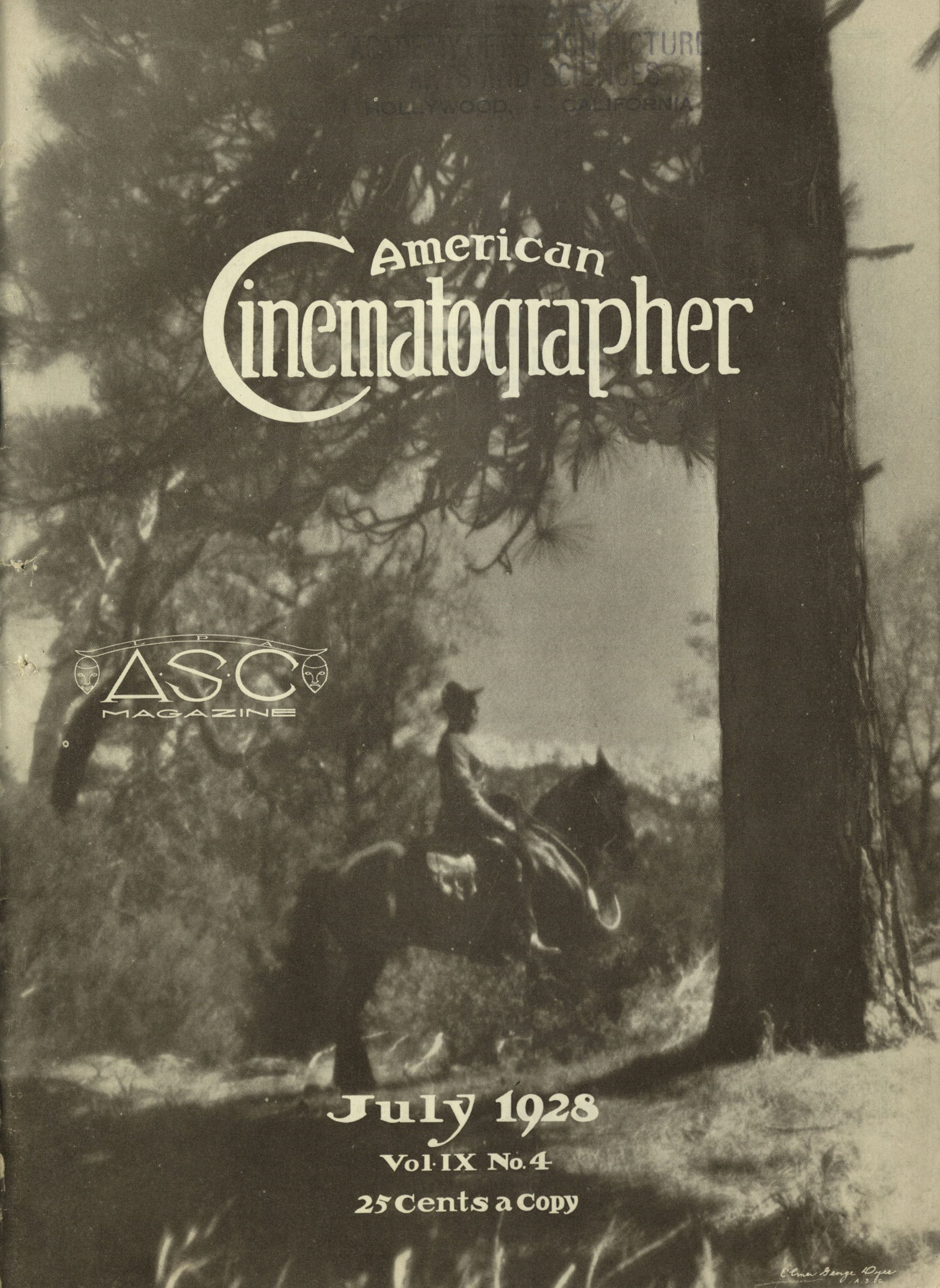

American Cinematographer

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MAGAZINE

July 1928

Vol. IX No. 4

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American Cinematographer

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Table of Contents

Editorial 5

Our A. S. C. Outposts
By Len H. Roos, A. S. C. 6

New Light On "Talkies"
By J. C. Kroesen 8

Something About the Talking Pictures
By Lewis W. Physioc 9

What's Ahead?
By Dr. Kenneth Hickman 11

A Study in Acoustics
By J. B. Engl 13

Technical Editor's Angle
By Joseph Dubray 17

The New General Electric Talking Movies
By James R. Cameron 19

Fox-Case Corporation Movietone
By Earle T. Sponable 22

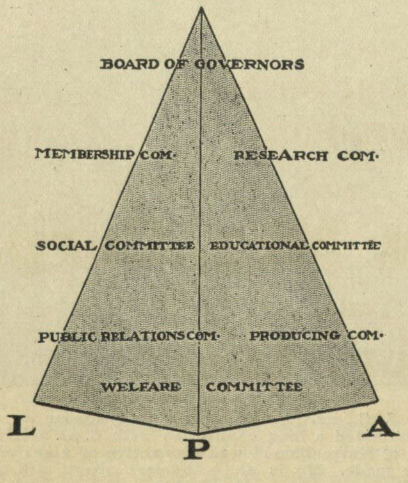
The War Baby of Cinematography
By Elmer G. Dyer 27

How to Order Mazda Lamps for Best Results at Lowest Cost
By R. E. Farnham 32

"Stills Move the Movies"
By Fred Archer, A. S. C. 37

Classroom Films
By Thos. E. Finegan 40

The A. S. C. Pyramid of Progress



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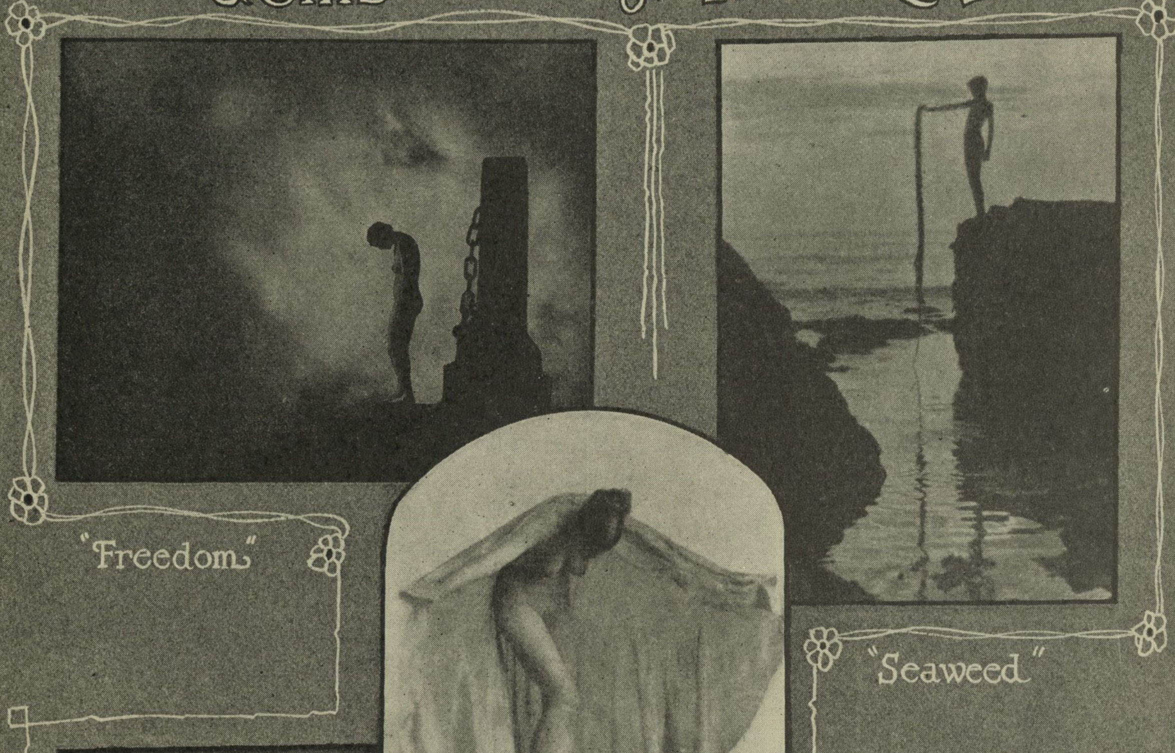
Photographic Gems by FRED R. ARCHER



"Freedom"

"Seaweed"

Illustration-Arabian Nights

"The Butterfly"

"Dreary Day"

An artist of whom the Society is proud is Mr. Frederick R. Archer, A. S. C., samples of whose work appear on this page. He is internationally known as a pictorialist and art critic. He has just terminated a long connection with C. B. DeMille and is now engaged in special research. Mr. Archer's work on "The Hunchback of Notre Dame" was productive of a set of art stills that will be remembered by artists and publishers so long as pictures are made. He is an enthusiast about still production in the cinema and believes that one way to sell motion pictures to the millions not yet in the fold is to divorce the still man from the production office and place him under the direction of the publicity department with a free hand to use his imagination and an opportunity to get the shots he needs.

EDITORIAL--The Voice of the A. S. C.

CLASSIFICATION

In the A. S. C. there are several classifications of membership—First Cinematographers; Second Cinematographers; Akeley Specialists; Special Process and Trick Cinematographers; News Cinematographers; Still Photographers.

These classifications are not arbitrarily fixed, but are brought about through the natural selection dictated by experience and training, every man falling into his classification as a perfectly logical consequence of his previous work in cinematography.

In cinematography there are no apprentices, so-called, but the training is nevertheless strenuous and thorough. An assistant cannot take his place at the camera as a cinematographer until he knows his camera and its uses like an engineer knows his locomotive, or like a scientist knows his laboratory apparatus.

Moreover, he must have a very comprehensive idea of production in general and of direction in particular, and must master the arts of lighting and of set arrangement, of properties and of the actors to be photographed. And in this connection it is safe to say that a cinematographer, trained according to the school of A. S. C., could come nearer filling 100 per cent the position of any other operative in the production of motion pictures than a representative from any other department.

This must be so for the very excellent reason that the camera is the fulcrum upon which the whole scheme of the cinema turns. Where his camera is—that is where everything happens. It is the sine qua non of the picture and the master of the camera is the synthesizer of the work on all the rest.

In the school of the A. S. C. the First Cinematographer, for instance, is usually equipped to do the work of all the other classifications, but first of all he is a master of photography, and, as Dr. Kenneth Mees, head of the Eastman Research Laboratory, recently said of the A. S. C.:

"You gentlemen here are known throughout the world without any dispute or question as the greatest exponents of the art of photography—there is no question about it—the cameramen of Hollywood are the greatest known in the art of cinematography—in that field you are supreme."

The photographic qualification seems, therefore, to be admitted by the highest authority, and this fixes the fundamental, for a cinematographer is nothing if not first of all a photographer.

His other qualifications must be consonant with this fundamental and the experience of the A. S. C., through the ten years of its existence, has been that not in a single instance has any member of the Society been recommended to a producer for employment wherein that man's qualifications were not strictly as represented, according to his classification.

If a man on the available list of the A. S. C. be sent to fill a position, the producer has learned that the goods will be as represented. If he require a man classed as a First Cinematographer this man will be a skilled workman, able to supervise the cinematography on any feature production; if an Akeley specialist he will know Akeley technique to the last word; if a Second Cinematographer, having in him the making of a First, he will fill the bill to the satisfaction of both his chief and the producer; and so on concerning the Special Process and Trick Men; the Still Photographers and the News men.

Classification, therefore, means something in the A. S. C. It is a guarantee of performance and, as such, it is rapidly being recognized by the production departments of all studios, besides those institutions requiring educational, industrial or special service.

TALKIE TALK

This, July, issue of THE AMERICAN CINEMATOGRAPHER is given over largely to talking pictures for the very excellent reason that this new development in the cinema world looms just now most largely in the minds of all departments of the industry. The material here gathered is instructive and authentic, as well as of intense interest. If any errors have crept in they will be corrected next month, but it is believed that our readers will find this matter all right. Look for our August issue.

A UNIVERSAL LANGUAGE?

"Universal Language" has come to be a hackneyed phrase in the cinema world, but the rapid development of the sound pictures has made thinkers both within and outside the industry wonder if this new miracle may not, indeed, be the means to bring about the establishment of a world wide language.

We have had Volapuk and Esperanto and either of them might have become a world language if people had had the time to take them up, but in those days we had no particular reason to go out of our respective ways to learn and help others to learn a new tongue.

But now there is a reason why there should be a world wide language and a tremendous force (the sound pictures) to help bring it about, and who shall say that it will not be done in good time. The cinema has wrought many a miracle since it came upon the world's stage and the evolution of a cinema language through the talking pictures would be only one more triumph. The motion picture may even become the greatest factor in the establishment of the long dreamed of brotherhood of man. Why not?

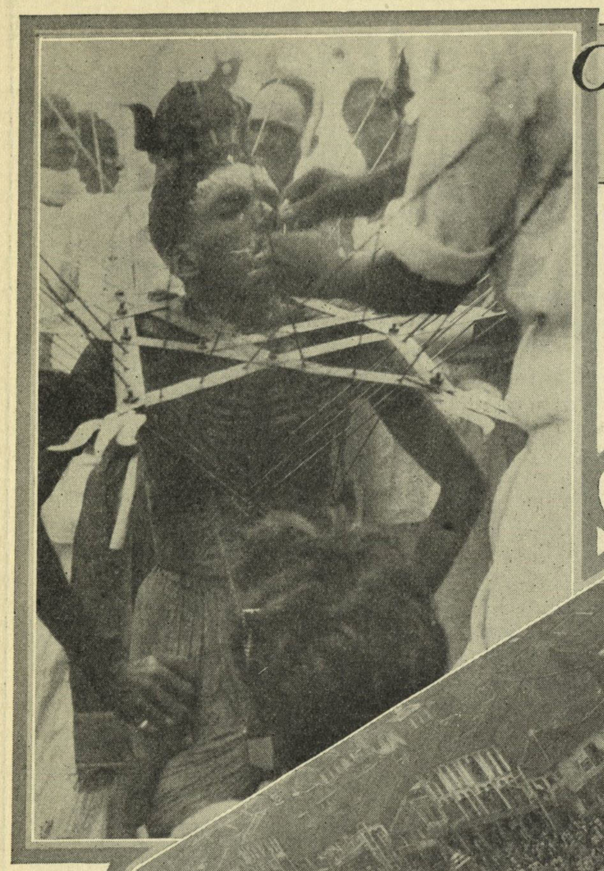
Our A. S. C. Outposts

The Pageant of the Far East As Caught by the Camera of a News Cinematographer

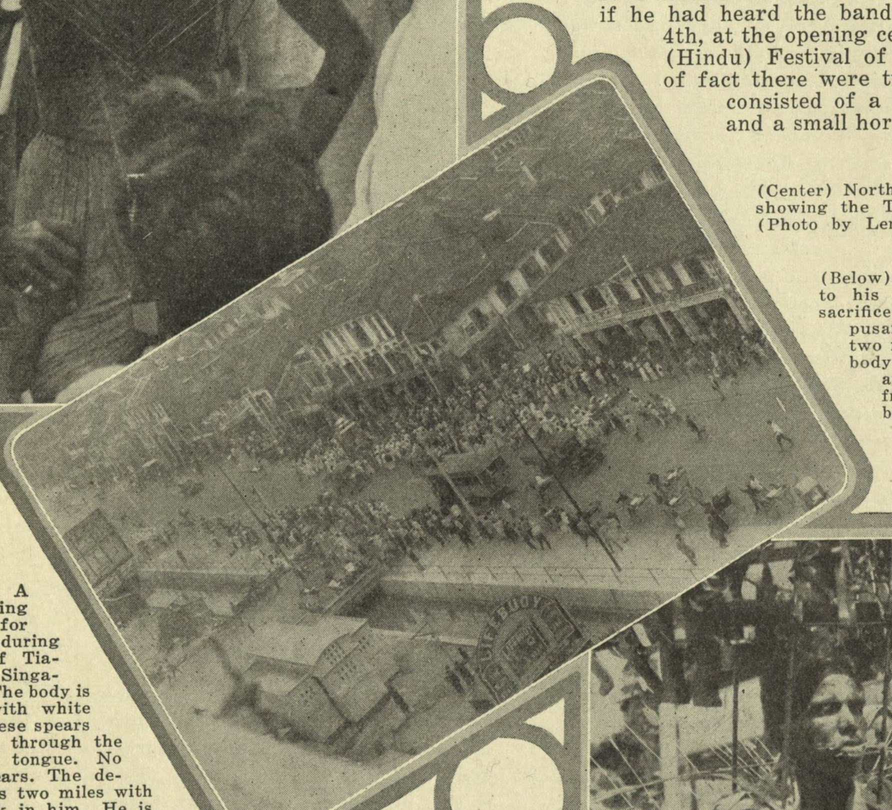
By Len H. Roos, A. S. C.

Sydney, N. S. W., Australia

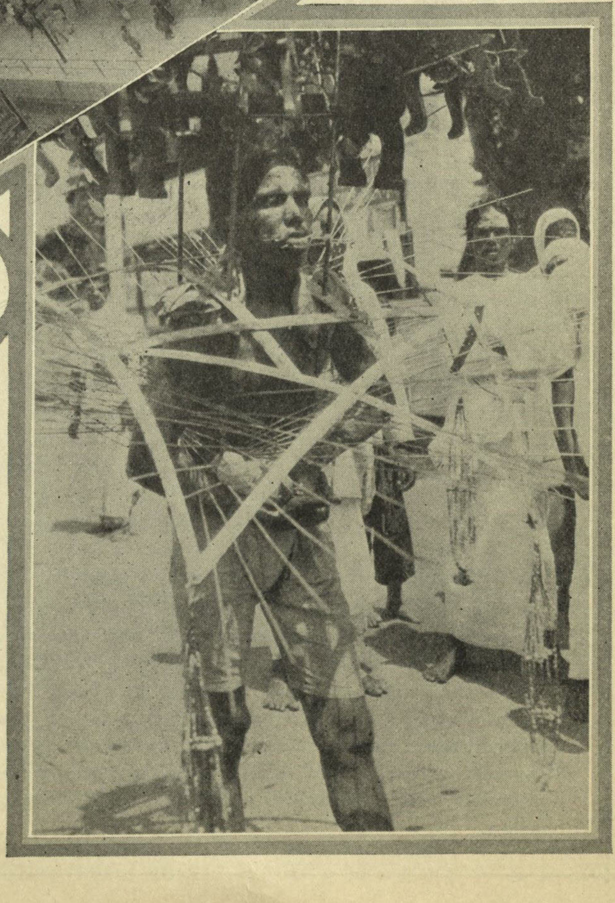
Mr. Noah Webster once wrote a book called a dictionary in which he describes and defines several things, among others a band. Mr. Webster says a band is "a company of musical performers." Far be it from me to doubt the veracity of Mr. Webster's statement, but I feel sure that the definition would be somewhat changed if he had heard the band on Saturday, February 4th, at the opening ceremonies of the Chetties (Hindu) Festival of Taipusam. As a matter of fact there were two bands. The first one consisted of a number of native drums and a small horn. The other consisted of several modern brass instruments at the small end of which was one native dressed in a white Sarong and white shirt. The tails of the shirt were left outside, adding to the general nattiness of the costume. The natives were possessed of powerful lungs and the technique of the band appeared to be every player for himself. These bands were to head a parade. The parade consisted of one small banner stretched across two poles and carried by two Chetties. Next came the bands. Following this some more natives with their long black hair done up in a knot at the back like a woman's; their bodies smeared with white ash and the excrement of sacred cows. Following this came the Silver car, a gaudy thing of solid silver studded with electric lights, supporting a golden ornament encrusted with jewels of every description and drawn by two sacred cows covered with bright colored trappings and ornaments. Straggling natives made up the balance of the procession which formed at the Subbaiah temple on Tank Road under the directions of two birds who



(Above) A Chettiar being prepared for sacrifice during Festival of Tiapusam at Singapore, S.S. The body is smeared with white ash and these spears are thrust through the flesh and tongue. No blood appears. The devotee walks two miles with these stuck in him. He is then supposed to be free from all devils and disease. Copyright 1928 by Len H. Roos, A. S. C. (Photo by Len H. Roos, A. S. C., A. R. P. S.)



(Center) North Bridge Road in Singapore, S.S. showing the Tiapusam parade in progress. (Photo by Len H. Roos, A.S.C., A.R.P.S.)



(Below) A Chettiar Devotee enroute to his temple while undergoing a sacrifice during the Festival of Tiapusam, Singapore, S.S. He walks two miles with these spikes in his body and tongue and when he arrives his body will be free from devils and disease, so he believes. 1928 copyright by Len H. Roos, A.S.C. (Photo from Len H. Roos, A.S.C., A.R.P.S.)

appeared to be the head priests. After the parade was lined up they started it off for Susu temple (Susu meaning milk) two miles away, and then climbed into a snappy touring car and left the parade and the bands to do their worst. They did. There wasn't anything else of interest this day. Hard stuff to shoot this on account of the natives' curiosity. They gather around the camera and block everything.

According to the advertisements in the paper, all that was to happen Sunday was a reception at night. Some people who have lived in Singapore for years told me what I might see so I disregarded the advertisement.

Have you ever had to stand behind a camera in the blazing sun, the reek of strong incense almost overpowing you and crank on a man being tortured? It is about as trying a job as anyone could devise.

If a Chettie is ill during the year he prays to his Deity to be cured, promising that he will undergo punishment as a penance. The punishment will also rid his body of all devils and keep him immune for all times as well as secure him a favored place in the hereafter, so he believes.

Sunday morning the compound of the Tank Road temple was a solid mass of half-naked, perspiring humanity. The streets were lined with vendors of highly colored drinks, Hindu books, pastries fried in oil, fruit and all kinds of food. After getting some crowd scenes here and close-ups of Hindu child mothers, little girls not more than ten or twelve years old with their tiny babies, I taxied to Susu temple on Susu Street. On entering the temple (Europeans must remove their shoes) I found a devotee being prepared for his sacrifice. A great quantity of white ash was smeared all over his body. Fruit was placed in front of a golden ornament as an offering and the smell of incense was overpowering. After a number of prayers had been repeated the devotee was taken outside and a framework of band iron was fitted to his body. This framework was composed of six half hoops about six feet in diameter supported by rods attached to a band about the devotee's waist. The whole business was painted with bronze paint and decorated with red ornaments such as you see on Christmas trees. After this cage had been adjusted the devotee was taken to the front of the temple where more chanting and incense were in order. The devotee swayed back and forth, his knees trembled and his eyes closed. His actions would lead one to believe that this incense has narcotic powers. After the prayers and chanting were finished (about 15 minutes) the devotee was again taken to the side of the temple and allowed to sit down on a small stool. The frame work and hoops came to about two feet from the ground and he hung onto the supports as a chap in white with shaved head (evidently a priest) stepped forward, and pinching the flesh on the devotee's forehead, drove a silver dart about 3 inches long through it. The devotee never flinched and there was not a sign of blood. The surrounding natives kept up a steady monotonous chant, one side first and then the other side answering what sounded to me like Vell-Vell, Vell-Vell. Another priest armed with a bundle of sharp-pointed spears each about three feet long and one-eighth of an inch thick stepped forward and after passing a spear through a hole in one of the hoops stuck the point into a banana and after pinching the flesh over the devotee's top rib jammed the spear through it and capped the point with a piece of pineapple. As soon as the spike was in place another attendant placed a small winged tin piece on the outside end of the spear. This spearing went on for over an hour with attendants fanning the poor fellow and the devotee not showing any pain as these spikes were forced through the flesh of his back, chest, abdomen and sides. I estimated there were 260 of these spikes stuck into this fellow and not one drop of blood appeared. As soon as the last spear was in place the devotee was led to the roadway in front of the temple and with many loud Vell-Vells a spear about six inches long was thrust through his protruding tongue parallel to his lips. On each end of this spear chains were fastened and the ends of these were fastened into the flesh on the devotee's temples by means of what looked like small fish hooks hooked into the flesh. Another spike was thrust through the tongue on an angle and still another added by sticking it through the upper lip, the tongue and the lower lip. Small brass jars were hung on his legs by means of hooks stuck into the flesh above the knees and the jars filled with milk. With spikes, spears, jars, etc., all stuck and hooked into place and with white ash liberally sprinkled over him, the devotee started a shuffling dance toward the Tank Road temple two miles away and every the band walked along and kept up a steady chant. On arrival at the Tank Road temple the devotee entered, inch of it in the blazing sun. Attendants followed by walked through a sacred chamber where the ceremonies were concluded and then entered a side room where all the spikes, spears, jars, etc., were removed. These fellows must be a total wreck after such awful experiences, but I was advised that they go to work the following day as if nothing had happened. They certainly must be in pain with all these holes in their bodies and tongues, but why they don't bleed is beyond me.

During the day I saw several devotees enroute to the Tank Road temple. Some had small silver darts about two inches long through the flesh of their chests and backs in weird designs. Some were walking fully speared and looking like a pincushion and pulling a small cart by means of ropes attached to large hooks thrust through the flesh of their backs. Some were walking on spiked shoes, some had jars hooked all over their bodies. There is no blood to be seen but it is a sickening sight and I was glad when I finished work for the day. While using the motor-driven camera on the road in attempting to get a close-up of one chap well speared and with spiked shoes an old fellow with an umbrella rushed me. He did not want this devotee photographed. He got right mean about it and my temper was not too even after being all day in the terrific heat watching these tortures and having trouble getting the scenes I wanted, I finally directed him to shove off to the opposite place to the one the devotee thought he would eventually get.

On Monday night a torchlight procession with the silver car ended at Raffles reclamation grounds where a big display of fireworks amused the natives until midnight. The streets were jammed with natives, who are great admirers of fireworks. After the show the silver car, the spikes, spears, hooks, jars and hoops were all locked up until Taipusam next February. Taipusam is a great sight to see once. It is a terrible and hard subject to photograph, and I'll bet I was just as thankful when I wrote "thirty" on my scene sheets as the devotee was when the last spear was withdrawn.

I went to the New Casino Cinema to see "Eulis Atjih" (Stolen goods bringeth evil), and I think I can safely say I have never seen a cruder picture. The make-up of the native players was terrible. The continuity was worse, and the titles—well, Al Boasberg should see them. The titles are in Malay and English both on the same card. If the title is too long they merely hyphenate it and carry it on in the following title. A letter insert is printed (after seeing the player write it). The star was a Malay boy who appeared to be a fair actor. Altogether, it was the best effort I have ever seen demonstrating how pictures ought **not** to be made.

Singapore boasts of a Japanese fish pond where you purchase your bait and fish in the various ponds. You pay for what you catch and can have the fish cooked on the spot if you wish. The fish run from $1.00 to $3.50 each, according to the pond you fish in. Unlucky fishermen, please note.

Sati is a Malay dish. A chap with a bamboo pole across his shoulders, a small charcoal brazier on one end and a big dish of sauce on the other, is the vendor. He fans the charcoal into glowing coals and twirls slender sticks with meat dipped in curry over the fire, and hands these to you as fast as you can dip them into the bowl and eat them. They are very good and as a midnight lunch they are hard to beat. They have a peculiar flavor and one can very easily acquire a craving for them. They cost two cents a stick.

On Friday, February 17th, after an exchange of several cables with Sydney, and after spending about one and a half months and many Straits dollars in Singapore, I packed my calcium chloride, my cameras and my other hat and boarded the K. P. M. steamer "Tasman" bound, as I thought, for Sydney, Australia.

(To Be Continued)

New Light on "Talkies"

Limitations of Conventional Methods Overcome by the Use of Two Sound Recorders-One of Which May be Increased Over Other at Will

By J. C. Kroesen

[*J. C. Kroesen of the General Electric Lamp Works, Harrison, New Jersey, is widely known as a scientist and engineer. He is a pioneer member of the S. M. P. E. and a writer and thinker of unusual ability. THE AMERICAN CINEMATOGRAPHER is glad to welcome Mr. Kroesen again to the ranks of its contributors.*—Editor's Note.]

My knowledge of talking motion pictures has extended over a period of about 25 years, starting at what was known as the Elite Theatre, owned and operated at 191 Market Street, in Newark, New Jersey, and a small theatre owned by J. J. Noonan across from the Patent Office in Washington, D. C., then through the various stages of new developments and inventions up to the present day. I have followed all of these developments as closely as possible from the engineering, mechanical and practical application to the theatre—also how they were received commercially.

At Washington, D. C., the use of spotted magnetism on a steel wire, a phonograph, and prior to my departure I saw a rough sketch and drawing which was prepared for an attorney by the name of Marcelis Bailey with the sound record placed adjacent to the phonographic record.

I was given to understand at that time that S. Lubin was approached on the subject but turned it down.

At Newark, N. J., I had the pleasure of seeing half constructed a projection mechanism—and portions of the model, after the theatre had been sold, and also many other devices and apparatus which followed.

Two talking picture apparatus particularly interested me—one using a motor, similar to that known now as the Selzin motor, only of a much smaller design, and the Renfax.

The other equipments and apparatus were variations to some degree of old ideas. This is even true of the present-day apparatus, with the exception that insufficient data was available on light sensitive cells and voice reproducing and recording apparatus, at that period.

Which may or may not be the result of radio research.

Now the scene is changed, science has been interested and has taken an active part, the proper light sensitive cells, radio tubes, loud speakers, repeaters and condensers, etc., have all done much for the advancement of the talking picture art.

Talking pictures have come to stay. To what extent they will be used in all theatres will depend on the ability of the manufacturer to produce the apparatus and films at a reasonable figure.

Their field of application, to entirely replace the spoken drama in general use, I feel is somewhat limited for the present, until such time as the public may be better acquainted with their results. The public as a whole has been fooled too many times. Road shows, weeklies, news reels, may play an important part in this education of the public—subjects made up for educational purposes would go a great way in regaining the people's confidence in talking motion pictures. The silent drama is the universal language, however, and will always be in demand.

Talking movies, if the price of equipment can be reduced, will be of great assistance to the neighborhood theatre, yet one apparatus must yet be developed before this theatre field can be completely equipped—the provision of the overture, theatre music other than for pictures, prologues. This may be done by using the standard motion picture film, and recording spirally with records adjacent to each other, photographic sound records, in conjunction with a continuous film attachment—or by the use of photographic sound records adjacent to each other with a reserving mechanism, which will change the direction of the film passing the light sensitive cell aperture.

Whatsoever method is used, this service should be provided for the small exhibitor.

The volume and tonal qualities of the sound reproducing apparatus must be clear, and as far as possible free from any effect that may be produced by a heavy air column in the sound reproduction apparatus.

Secondary amplification should be used where the throw is long or the theatre is of such size as to require additional volume.

The screen should be divided and so arranged that sound will be reproduced only at or as near the point of action as possible.

Films must have a universal starting point, and apparatus provided, to mechanically change the angular relation between the light and sound records, and in such a manner as to make possible and sufficiently flexible the starting points of the film records, thus making possible the location of the point of synchrony at the center of the theatre.

Errors are made by our engineers in creating a universal starting point, and not providing a universal starting apparatus, to compensate for the throw and theatre size—very often a talking picture may appear to be in synchrony in the viewing room or from a location at the front row of seats in the theatre, but when projected in a large theatre and viewed from the rear seats of a large theatre the talking picture is said to be out of synchrony. Some engineers may say this is not correct—for your own information try it yourself.

Recently I had the privilege to view some talking pictures from the loge seats of one of our Broadway theatres, and from where I was located the picture was out of time with the sound record—from the front row of seats the picture must have been in time with the sound record—yet the previous day films were returned because they were two frames slow. Had provision been made to correct this error these films could have been used, —if the picture was viewed from some particular part of the theatre it might be found, if viewed from some other location, to be correct and adaptable to the small house.

Change the projection speed if you will, but you still have these corrections to make.

The so-called talking picture of today and yesterday is but a method of educating the public to crowd the theatre at some section, making these seats more desirable than the remainder of the theatre seats. If you ask the patron why he desires to have one of a particular group of seats the reply may be "looks better there and I can hear better." The heavy sound column emanating from a horn may have the effect of producing this result, driving the patron away from the front seats.

It must be remembered that you are not broadcasting a farewell from the top of some lofty building to an engineer or executive leaving for some foreign port on a boat in the East River some half mile distant. Some of your audience is for all practical purposes located close to and in front of the motion picture screen, only a few feet away. If a theatre requires speech amplification for the spoken drama, it surely requires it for the talking movies. Several other reasons may also be stated for this method.

Sound reproduction at the screen should be located at, or as near as possible to the point of action as may be practical, and not from the top, side or bottom of the motion picture screen or orchestra pit.

In a regular theatre the stage setting acts as a back-

(Continued on Page 39)

Something About the Talking Pictures

LEWIS W. PHYSIOC

About twenty-two years ago a young man working at the old Fourteenth Street Theatre in New York, used to sneak down from the paint bridge during dull moments and watch the pictures—in those days they were projected on a thin, transparent curtain, lowered after the vaudeville acts.

At one time they were showing pictures of the naval maneuvers, and back stage a clever fellow was working the effects. He had a quantity of fine shot in a box which he rolled back and forth, imitating the sound of heavy seas that broke over the bows of the ships. Now and then the great guns spurt forth fire and smoke. The fellow back stage at each discharge of the guns gave a husky stroke on the bass drum. He had it nicely timed—he waited just long enough to compensate for the difference between the velocity of sight and sound. The people applauded. They evidently considered it a very realistic effect. This was probably the first attempt at synchronizing sound and the picture.

Those fascinating pictures lured the young man from the paint bridge of the legitimate theater to the motion picture studio, and he soon found himself with the Cameraphone Company "talking pictures." They were operating in a small room over Daly's Theatre. What a wonderful system they had (when we review it at the present day). They would turn on the phonograph, using any of the stock records, and rehearse the actors in following, as closely as possible, the words and music, and when they "had it down pat" they were photographed while keeping pace with the record. It was the interesting proposition of using the voices of Len Spences, Ada Jones, Collins and Harlan and other favorite recorders of the day, with the photographs of any actors who had the nerve to pose for the pictures of that period. The next step was to try and start the projector and phonograph as nearly together as possible. By means of a governor attached to the projector a clever operator could maintain fairly good synchronism, but any approach to success depended entirely on the individual skill of the operator.

This idea—the Cameraphone—was conceived by one J. A. Whitman, but it being somewhat an encroachment on the regular pictures, they enjoyed very little encouragement. There was a persistent cry that "the people didn't want them." Ever since the inauguration of public entertainment, there have been those sages who always "know what the people want."

Despite these discouraging predictions, at the end of two and a half years, Whitman found himself operating in a tremendous plant, with an extensive recording department, machine shops, matrix and moulding department, a large orchestra, several directors, a numerous stock company and hundreds of trained operators on the road—the whole representing one of the most imposing establishments in the picture business of that time. This company was a matter of considerable uneasiness to the Patents Company, who were, of course, among those who contended that the public did not want talking pictures.

Had it not been for business controversies and organized opposition, the Cameraphone might still be a thriving concern, moving along with the times and enjoying all of the improvements that modern science has furnished.

Despite the failure of the Cameraphone, the general cry of "no talking pictures," there were many others working to that end: The Cinephone, Webb Talking Pictures, Gaumont, O. E. Kellum and others.

When the Cameraphone suspended operations, Thomas A. Edison became interested again—we say again—because it is not generally known that some of Mr. Edison's earliest experiments anticipated the idea of synchronizing the record and the film. He engaged Daniel Higham, a man of great mechanical genius, to conduct these latter experiments. It may be interesting to mention also that William Waddel, business manager of the Edison Kinetophone, was for some time associated with Dr. Lee De Forest, and is at present with the Movietone.

Higham was the inventor of the Highamophone, loud speaking phonograph of the Columbia Company, and had the task of devising a similar machine for the Edison Company. He also perfected a system of mechanical amplification for the record, which provided a greater scope in recording delicate and distant sounds. The combination of these two devices permitted of recording over the entire area of a large set and to furnish sufficient volume for the average sized auditorium. He also contributed the mechanical synchronizer which allowed the picture and the record to be made simultaneously for the first time. It would be interesting to view some of those pictures today and compare them with the present standards, and no matter what that comparison might show, we should justly speculate as to what extent they may have developed with the aid of radio amplification and electrical recording. Even at that time the Kinetophone system permitted of just as elaborate production as the regular pictures of the period. Very commendable tabloid rendering of the classic dramas and operas were presented, using natural backgrounds, etc. We have seen many of the celebrities become enthused over seeing and hearing themselves as others saw them. A very striking and pathetic instance as to their value as a record to posterity was furnished when the surviving member of the famous team, the Rogers Brothers, viewed a picture made shortly before his brother's death. Our well-known Edmund Breese thrilled at seeing himself in a production of his famous "The Master Mind." Many subjects were done in talking pictures at that time which were subsequently produced in the silent pictures, and which may yet be done again in the improved "talkies," "The Bells," "Which Shall It Be?", "The Bohemian Girl," "The Chimes of Normandie," "Faust," "Pinafore" and many other classic subjects little known to the present younger generation. The popularity of the Kinetophone was signified by Mayor Gaynor having used it in campaigning for his election.

About the time that the Edison Kinetophone was ready for the public, this company exhibited an attitude that cannot be explained, except for that well-known trait of Mr. Edison's for under-estimating some of his most valuable ideas, yielding to that persistent cry, "The people don't want them," or, what is more likely the business complications arising from the Patents Company objecting to a member of that organization putting out a product that might prove injurious to their general interests. This last reason was probably responsible for the Kinetophone being introduced as a vaudeville feature of the United Booking Company. During the short period of exploitation through this medium, the popularity of the Kinetophone can hardly be questioned; in proof of which we recall Zitel's famous vaudeville chart, in the Evening Journal, and the Kinetophone for months headed the list . But during the entire time they suffered the enmity of all connected with the silent pictures. Rumors were set afloat by some more favorably inclined that the operators were paid to purposely throw them out of synchronism. The operators, themselves, were antagonistic towards them for various reasons, chief among which was the lack of extra remuneration, for what they considered an added responsibility. At any rate the Kinetophone was suddenly recalled, long before the expiration of the contract.

Although the attitude of the Edison Company suggested an acknowledgment of failure, there were many who refused to accept that assumption, but suspected other reasons. Many other bright minds persisted in their experiments to associate those two wonderful systems of reproduction, the phonograph and the motion picture. What could be more attractive to the scientific mind? Here was the one reproducing the speech of mankind, and his great musical accomplishments, independent of action; the other reproducing action without the accompanying sound. Why should not the co-ordination of the two be the ultimate achievement?

We now introduce an interesting sequel to the foregoing reflection, which illustrates the pugnacity of the student mind. After the retirement of the "talkies," the wiseacres began to buzz again. "I told you so" was heard on all sides. Some among them, a little more palliative in their attitude, said that the talkies would never be successful until it was possible to put the record on the film of the picture. They acceded this much with a sort of reservation that seemed to imply a suggestion of the impossible—like the fellow who said to his starving pal, "If we had some ham, we could have some ham and eggs, if we could find the eggs." They little realized that their speculation embodied a prophecy. This prophetic suggestion began to materialize in a field of science far removed from any idea of talking pictures, and unknown to most picture people. Experiments were being conducted with that mysterious force which was beginning to excite the interest of everyone and which they called "wireless telegraphy."

Ernest Ruhmer seems to be among the first to observe a peculiar relation between those mysterious radio waves and those of sound, which suggested the possibility of converting sound waves into light for the purpose of recording by photography. But it is doubtful whether he had any vision of an association between his experiments and the motion picture film—he merely responded to the urge of scientific research. It remained for others to recognize in those experiments the solution of that fascinating problem of combining sound with the motion pictures. So, we soon began to hear of Dr. Lee De Forest, with his Phonofilm; Delmar A. Whitson and his Photophone. Others experimenting with the idea of talking pictures were: Professor J. T. Tykociner of the University of Illinois; Grinnell Mathews of London, England; Sven Alson Bergland of Sweden; Eugene Lauste of France; Vogt, Engle and Massole of Germany and William F. Alder, a well-known former cameraman of Los Angeles.

Now as to their claims of priority a search of the Patent Office and a review of considerable publicity establishes the fact that the young Los Angeles engineer, Delmar A. Whitson's activities date back to 1912, and that after several years of persistent research and experimentation, was granted general patents giving him rather broad claims on a method of recording and reproducing sound on and from the edge of a motion picture film, by means of the peculiar characteristics of the photo-electric cell and by polarized light. We find that Lee De Forest came close upon his heels and actually precedes him in giving a practical commercial demonstration. In substantiation of this we quote from the Radio Journal of September, 1922: "It seems certain that the Swedish inventor, De Forest, and Whitson have both reached the same results. Whose is the better invention for commercial use remains for the future to determine" (another significant example of the proverbial channel of great minds, even in the choice of words, is the announcement by the Radio Corporation of America of their "Photophone" after twelve years or more of intermittent publicity about Whitson's "Photophone").

Then came the "Vitaphone" the "Movietone" and the General Electric system and the announcement from various producers as to their intention regarding talking pictures. But still the old cry, "the people don't want them," and this despite the fact that for years clever organists and orchestra leaders have endeavored to keep time with marching troops, dancing, etc., and the injection of all sorts of comic effects.

Now we hear, from all directions, the question "What is the difference between these various systems and their claims to originality?" It may be interesting to the uninformed to distinguish between them.

The Vitaphone depends upon a phonographic record synchronized with the picture. It differs from the early Edison Kinetophone in that the Edison pictures were synchronized by a mechanical device, the camera and recorder—or projector and phonograph being connected by a fine silk cord (or belt) with the synchronizer as the mediator. The record was also amplified by mechanical means, whereas the Vitaphone record is made and reproduced by the modern electrical method, made possible by the perfection of radio and synchronized with the picture by the synchronous motor, the improvement of which is also due to radio developments. This system occupies an unique position and enjoys great protection by being an improvement of older systems forgotten and neglected, and it is well known that patent rights depend a great deal upon the diligence and persistence of the inventor.

The other systems are included in the proposition of reproducing sound by photography, either on the edge of the picture to be projected, or on a separate film, in the latter case synchronism, again, becomes a feature. The photographic system is, in turn, divided into two classes; the variable density and the variable area. The variable density system means that pitch and volume of the sound are produced by a series of bars, visible on the developed film, graduating from a very dense to a faint image, each agreeing to the strength of the pulsations of the beam of light metamorphosed from the sound wave. The variable area is observed as a saw tooth image of uniform density, the pitch and volume being determined by the length and breadth of the saw tooth forms. In the variable density correct exposure and development of the film are factors in good recording and reproduction. In the variable area, the matter of density is not so important, except when development is carried to a point of heavy fog.

In according credit for achievement in this much disputed field we may say with old Sir Roger De Coverly: "There is much to be said on all sides." Let us forget James A. Whitman of the old Cameraphone, who probably still believes in talking pictures; Daniel Higham of the Edison Company, who first made the record and picture simultaneously; Dr. Lee De Forest, who gave the first demonstration of sound photography in connection with the pictures, and Delmar A. Whitson, who seems to occupy the position of one Mr. Damocles, holding his sword (patents and diligence) over the heads of De Forest and Movietone; W. F. Alder, who might sound a tocsin through the published accounts of his experiments, and, lastly, Warner Brothers who, in the face of years of crying "the people don't want them," had the courage or business acumen to invest millions of dollars in the Vitaphone.

But over them all there looms a great shadow, like some dramatic eclipse, that temporarily dims the glory of those who rest within its great penumbra; the records of one solitary Mr. C. E. Fritts, deceased, who, in 1880, long before these things were thought of, filed papers embodying such broad claims as to leave very little to his successors, and which have been interpreted by some authorities as covering about everything connected with sound photography. This genius was so far in advance of what was then known of his subject that it was, no doubt, this reason for his patents pending for the remarkable period of thirty-six years.

In contemplating this man's breadth of knowledge, we are constrained to believe that there were minds so isolated by their brilliance and originality that their achievements are practically worthless to mankind until approved by other bright minds. Nor should we discount the merits of these successors, for appreciation is the matter of equal values—the mirror will reflect no more than the image.

What's Ahead?

Address Delivered by Dr. Kenneth Hickman at the Convention of the Screen Advertisers Ass'n. at Rochester, N. Y., Nov. 1927

I am going to abuse my privilege as an after dinner speaker and talk to you rather seriously about a subject which is very near my own heart, and if it is a little too much of a sermon I hope you will put it down to inexperience rather than to lack of good taste.

I want to trace the attitude of ourselves as Manufacturers to the general public as Consumers, because you will agree with me that your own province of Advertising is intimately connected with the bringing of these two aspects together.

I think we can say that every kind of manufacturing has got these two attributes; that there is a manufacturer and a consumer. Now the large run of manufactured articles are the product of skilled labor, skilled design and skilled supervision, but when they go to the public they are sold to an absolutely unskilled user.

Take matches, or jelly tablets, or cigars—they all want very careful making, very careful supervision; because when they go out to the public any fool, so to speak, may use them. However, as civilization goes on, there comes a class of product which is more and more dependent on the skilled user. Consider for instance the automobile industry; there you have your skilled manufacturer, and automobiles turned out by the million, passing in turn to millions of people who have just a little skill; just enough to know when to change oil, how to change tires, when to put on chains and so forth. This is the transition stage.

An example of the final stage is the paint manufacturer. He is a highly skilled man. He must choose his colored powders, reduce his powders to emulsions, add the emulsions to oil and so forth, and then he is able to sell his paint, not to the general public but to a lot of skilled painters who use it for the general public. If the manufacturer has a particular kind of paint, such for instance as the cellulose finishes which have come out lately, the manufacturer is able to tell the skilled user how to use the material. The user on other occasions, being a skilled man, is able to reciprocate and tell the manufacturer what new wares he is needing. Now let's come down to the photographic industry and particularly to the motion picture industry.

You don't have one skilled user there, you have a whole chain or cascade of skilled users. Your film manufacturer supplies a certain product, a film; your studio provides another product, acting. These two go together and are sold directly to a camera man, and a camera man is a very skilled user. He is supposed to do nothing but turn the handle. I have watched camera men in action and I know they do a very very great deal more than turn the handle. They are responsible for the whole interpretation of the artist's and director's idea on the film. But the camera man is not the end of the story. Directly the film leaves his hand it goes to the laboratory man and is developed. The laboratory man passes it on to the printer and the printer can make or mar the product. Then finally you have the finished film.

Is this finished film the commodity the public wants? Not in the least. The film has got to be sold to the public through the means of projection. So there has come into being the skilled projectionist and the specially designed movie house. You may say all the way down there must be five or six steps from skilled manufacturer through skilled users to the general public, who is now a very educated public.

I want to dwell for a moment on what we mean by skilled manufacturer. Photographic knowledge, so far as the film making end is concerned has always been treated as a deep and magic secret. Yes, you may know all about using film but you must not enquire how it is made. I want to banish this mysterious atmosphere because it is not a thing intrinsically connected with secrecy at all.

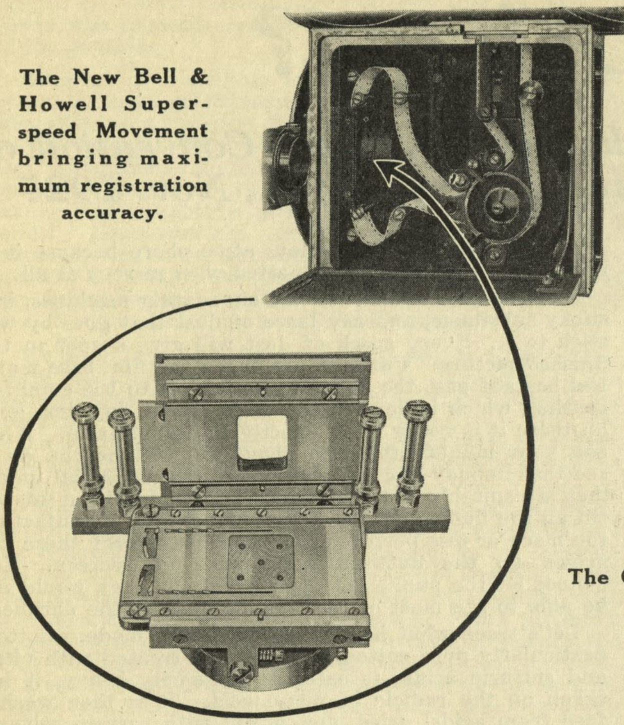
Film, when it is made on the big coating machines, is a sticky substance, and any trace of dust that goes by will stick to it. Every speck of dust will give a spot in the finished picture. Furthermore, when the film base material has got past the sticky stage it goes to the emulsion coating, which is done in the dark, and if any dust goes on there it is going to do exactly the same harm. What can your manufacturer do about it? All he can do is see that nobody goes into any of the rooms at all unless they are suitably clothed in material that has been washed till all the fluff is off, and then he is able to manufacture the more or less perfect product. That is why there has grown up the outward appearance of secrecy. You cannot let the public in. And if you did they would not be able to see most of the time because of the darkness.

Let's trace what happens when film is made. Cotton, particularly pure cotton, is taken and treated with nitric and sulfuric acids; it becomes extremely heavy, it has taken on the radicle of nitric acid. It is then washed free from acids, dried, and mixed with certain solvents which give a viscous, treacly fluid which is poured on a special machine for drying off the solvent. Inside of each one of these machines is a great wheel turning slowly, and on the top of this wheel the treachly substance is poured and it starts flowing down the outside of the wheel in the direction the wheel is going. All the time the solvents are evaporating; and by the time the dope is about to tumble over one side, instead of dropping off, it has become solid. By the time it gets all round the wheel it is sufficiently tough to be stripped off as a film sheet, when it is taken over hot rollers and dried ready for emulsion coating. As I have said the chief secrecy about emulsion coating is that it has to be done in a dark, dust-free place.

Finally, let us consider the emulsion-coated film. We have two kinds nowadays, the 35mm. professional stock, and the 16mm. generally used for amateur movies. I object to 16mm. being termed "amateur." Certainly, your standard film, from its very expense is a professional matter. How about your 16mm., your small film? What have we seen in the ordinary kodak business? There was a time when the amateur used to buy a camera, go out and take a few pictures, come back, get in a dark cupboard, splash about in two or three wash basins and take his pictures out to dry. All that has given way to: "You press the button and we do the rest." Now this state of affairs already exists with the 16mm. film. It must be developed by a complicated reversal process and the amateur has automatically been relieved of everything but the pleasure of taking and projecting. And a tremendous amount of it he is doing. The manipulation, you will agree, is entirely professional. But will professionalism stop here? Will there not be superimposed on the great amateur taking business the further business of making and selling "shop-made" entertainment or information?

Now, for the expansion of the 16mm. professional business either the film has got to become very cheap, or else money has got to become more plentiful, or the film lending library has got to come into existence. People say: "Why aren't there more libraries?" The answer is there will be more libraries when there are more customers. You say: "If we had more libraries we would get more customers." I reply that is the old story of the hen and the egg, and remark that you can buy eggs cheaper than you can buy hens. The thing has got to grow from small beginnings; unless you have a lot of altruists with sufficient idle money to buy the hatched library hen. But

(Continued on Page 38)



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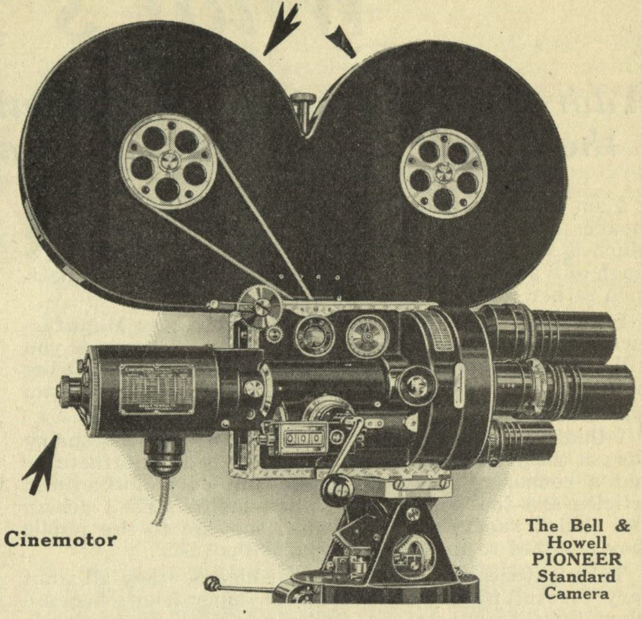

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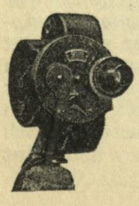

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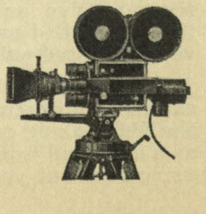

A Study in Acoustics

"Some Remarks on the Acoustical Properties of Rooms"--- Looking Forward to the "Talkies"

By J. B. Engl*

Transaction read at the spring meeting of the Society of Motion Picture Engineers, Hollywood, Calif., from April 9 to 14.

The art of recording and reproducing motion pictures is going to be expanded. In a short time general use of "speaking film" processes will be a matter of fact. In the following lines I will try to give a short review of the principles involved in the acoustics of recording and reproducing rooms, and I hope my paper may be of some interest to those who will devote themselves sooner or later to that new division of the motion picture art.

1. General Remarks.

In a room where a sound phenomenon occurs, we distinguish between a specific **source** of sound, the medium by which the sound waves are carried to our ears, and some additional boundaries such as walls, floor and ceiling, or bodies of any kind inside the room. The source of sound may be a natural one, such as a singer, speaker, or musical instrument, or an artificial one, such as a means for reproducing recorded or transmitted sound waves. Of these latter we will speak later. Since the medium which carries the sound waves to the ear or a microphone is always air, one fundamental property of this medium is very important. The ability of the air to transfer sound energy is very small. This is because of the difference in density between air and the material of the sound source, consisting of wood or metal, as well as the differences in the modulus of elasticity. This is the reason why in all practical cases of sound production large quantities of air have to be in contact with the vibrating parts of the sound source. I refer to the resonance board of the piano, resonance bodies of all wood instruments, and so on.

The sound vibrations in air are known as longitudinal vibrations, a periodical series of expansions and compressions, traveling with a velocity of about 330 meters per second, depending on the temperature of the air. The velocity of propagation in air is the same for all frequencies of sound waves. The frequency range of the waves is limited by the audibility limits of the human ear. On an average we can assume about 16 cycles for the lower limit and about 16,000 cycles for the upper limit of audibility.

It is a generally known fact that the propagation of sound waves does not occur in straight lines like the propagation of light. Sound waves, especially of low frequency, go around corners and obstacles. The physical reason for that is the length of sound wave. The wavelength at the low frequency of 16 cycles per second is about 20,600 centimeters, while that of the frequency of 16,000 cycles per second is 2 centimeters. We see that in the case of lower frequency, the wavelength is comparable with the dimensions of obstacles.

The length of the recording rooms is usually about 10 to 20 meters and that of the reproducing rooms from 50 to 100 meters. When sound waves impinge on the boundaries of the room, a reflected sound wave goes back from the boundary but the intensity of the reflected wave is only a fraction of that of the impinging wave, the value of which depends on the material of the boundary. The co-efficients of reflection have such a value that quite a number of reverberations can occur before the wave intensity is weakened enough to be of no more importance. It is clear that under these conditions a sound wave will pass directly to the ear or microphone, and a part of the same wave, after several reverberations, will pass again to the ear or microphone, but of course weakened somewhat in intensity, and after an interval of time, depending on the distance traveled by the reflected wave. If the time lapse is great enough, we call the effect an echo, but if it is smaller, it is called resonance.

Sound is not propagated through the air only, but also through solid bodies. In solids, the rate of propagation may be from 3,000 to 10,000 meters per second. This kind of propagation of sound can be of importance and also a source of trouble.

The sound emitted by the source is generally of a very complicated nature, consisting of frequency components of different cycles and intensities. As the co-efficients of reflection depend on the frequency, it is clear that the components of the reflected sound waves may be changed in intensity and therefore the sound quality changed.

2. Recording Rooms.

Let us assume a microphone arrangement, transmitting equally all frequencies. This microphone is standing at some point in the sound field, and generating electric currents varying with the sound intensity in the field point. This sound intensity is built up of several components, firstly the direct waves coming from the sound sources and secondly, of the several reverberating waves arriving from walls, etc.

One important difference between the normally used microphone arrangement and the human ear is apparent. We have two ears, at a distance of 15 cm. from one another. This means that we perceive sound intensities in two different points of the field. Furthermore, the human ear is a narrow tube, the sound-sensitive parts of which are arranged on one side of the tube while on the other side of the tube we have the shell of the ear. As a result, we hear sound waves coming from a certain solid angle. The microphone now used generally in broadcasting and sound recording, has only one sound receiving part and has no particular directional effect. The consequence is that we are able to locate sources of sound exactly by finding the direction from which the sound waves come. Our brain has the ability to perceive the phase difference between the sound intensities in the two points of the field. In this way we can even locate the positions of all the instruments of a big orchestra, assisted, of course, by the difference in sound quality.

In order to get a natural sound record, we have to imitate these conditions existing with the ear. We have to use two microphones with slight directional effects and to take care that both alternating currents produced by the two microphones are treated independently. This means that in broadcasting we have to use two independently modulated carrier waves, two receivers, and two sound reproducers and in sound recording we have to make two records and reproduce them independently. The first has already been tried with very good results, but is, of course, too involved for broadcasting conditions. The second method for sound recording has not as yet been used but can easily be realized, with small additions to existing apparatus. The trouble caused by the sound waves being conducted by solid bodies to the microphone can easily be avoided by mounting the microphone correctly as is done already in all broadcasting stations. But we must not forget that in the case of deep organ pipes, big drums, etc., we actually feel the sound being conducted to our body from the floor. If an impression of realism is to be given, we must consider this possibility.

The secondary sound waves have given considerable trouble in sound recording. Long experience in broadcasting has developed certain methods of adjusting the intensity of the reverberated waves. An important factor here is that our instruments of transmitting and repeating microphones, amplifiers, loud speakers, etc., are not yet 100 per cent perfect. Any small defects in the apparatus apparently magnify the bad effects of secondary sound waves. Experience has shown that in recording,

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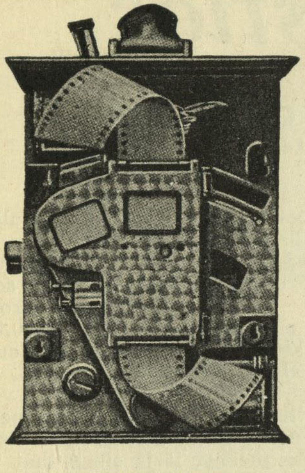
*Technische Hochschule, Berlin.



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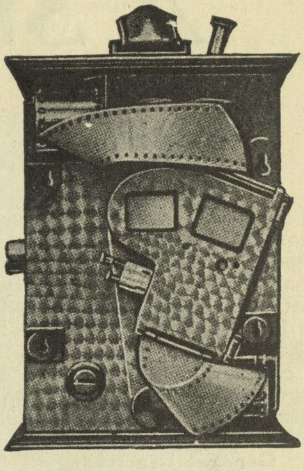

POSITION DURING FOCUSSING ON GROUND GLASS

By simply moving displacement apparatus on top to the right, the film gate slides to the right taking the film with it and the ground glass comes into position at the aperture. The crank movement automatically locks and direct focussing may be done on the ground glass. The image is shown right side up, full size of aperture, and magnified nine times to assure accuracy of detail. Not only is this feature valuable when changing to lenses of different foci but also when using the same lens for various distances. Other distinctive features are:

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the walls and furniture should have a greater absorptive power for sound waves than is necessary for good oral acoustics. The general principle therefore, is to reduce the intensity of the secondary waves. This is done by laying carpets on the floor, by covering the walls with soft absorbing materials, and by partially cutting off the reverberations with hanging carpets. All this can be done only to a certain degree. If all reverberations are destroyed, the characteristic impression of the sound quality of hearing in a closed room is lost. Only practical experience together with exact measurements of reverberations can guide us in this problem. Quite simple arrangements are very efficient in regulating the intensity of the reverberations. For example, it is a good plan to arrange on all walls wooden frames of a depth of about 1½ meters rotatable about a vertical axis and at distances of about 1 meter. By this framework the secondary sound waves are scattered in all directions and by multiple reflections inside the framework are decreased in intensity to a suitable amplitude. The recording of speech requires a smaller reverberation effect than musical productions.

An ideal way to remove all reverberations is to record in the open air. The secondary sound wave reflected by the ground has so small a phase difference from the primary wave, that we have practically no reverberation at all. We have to remember this in connection with reproducing. In certain cases an overwhelming effect of intense reverberations is desired. An organ playing in a big hall or church, a full orchestra in a large symphony hall is connected in our memory with the effect of sound waves acting from all directions on the human ear.

3. Reproducing Rooms

The reproduction of sound, especially for the purpose of the talking film, generally occurs in rooms of large dimensions where several hundred or even thousands of persons can be accommodated. The sound reproducers are arranged in one part of the room. The first problem is to fill the room equally with sound, so that each person can hear equally well. Now all known types of loud speakers radiate in one direction only, and emit their radiation in a certain solid angle which depends on the type. Horn type loud speakers radiate in a comparatively small angle and have therefore a decided directional effect. Hence several instruments must be used, arranged so that the solid angles of the radiations fill the room, overlapping only slightly. This is a matter of experiment and is always different with different rooms. Loud speakers with piston-like vibrating diaphragms have a greater angle of radiation and a less directional effect. It is easier therefore to arrange them. A factor which greatly diminishes the intensity is, of course, the presence of the hearers. Dependable experiments therefore can be made only in a full house. The dampening effect of the hearers can be calculated by using figures obtained in the extensive measurements of W. C. Sabine.

In rooms, where sound reproduction only is desired and no visual impression on the hearer required, it is, of course, easier to equalize the effect of reverberations at all points of the closed space. This can be accomplished by installing more than one set of sound reproducers, not only on the stage, but at other places in the room itself, where otherwise only weak sound amplitudes would be heard. By means of these additional sound sources, rooms can sometimes be given tolerable acoustical properties, which otherwise, in the case of one speaker placed at an unsuitable point of the room, are decidedly bad.

For the reproduction of speaking films, this method can only rarely be used, as it is not feasible to diminish the idea of sound coming from the screen. This latter point is of great importance for installing loud speaker outfits in motion picture theatres. The hearer naturally expects to hear the sound waves coming from the corresponding persons or objects shown on the screen. Arrangements which injure this impression destroy the illusion. In theatres, where talking films are to be reproduced, the position of the loud speakers should be almost identical with the screen. Arrangement, for instance, of horn-type loud speakers with the mouths of the horn

(Continued on Page 28)

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Perry, Harry—Caddo Prod.—Met. Studio.
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Witzel, E. L.—Universal.

Technical Editor's Angle

Joseph Dubray Takes Time Out of His Vacation to Analyze the Talkie as It Is Now and to Do a Little Prophesying

[*The dignified Editor-in-chief will overlook being called by his nickname this once just to show the Technical Editor that it is a relief to get a human document from him—one that is not all cluttered up with technical terminology, charts, and scientific verbiage.*—EDITOR'S NOTE.]

To the Editor-in-Chief of the
American Cinematographer
Dear Si:—

So you had to find out where I have hidden myself for two short vacation weeks!

Now, imagine yourself just enjoying the beauty of our hills, tramping around, fishing a little, your mind just forgetting everything but the joy of living—Imagine yourself just returning from an exploring expedition with a bunch of good fellows, tired but happy, making plans with the happy crowd for the morrow and find at the lodge such a telegram as this:

"Decided to advance one month publication of talkies number. Please send in your contribution."

And this after we had decided that I was going to forget for two weeks that film and lights and filters and colors and lenses and all of the paraphernalia that keeps me well occupied for fifty weeks a year, didn't even exist!

Now, Si, think, ponder on your crime and—Well I am going to punish you for it! I am going to wire you back that I will send in my contribution, as you call it, but I am going to send it in as late as possible and I am not even going to think of it until the very last minute, so you will not have the privilege of making any use of your editorial blue pencil—and I cannot think of a worse punishment for an editor!

On the other hand, I might thank you for the opportunity you give me to forget for once all technicalities and approach a subject under an entirely different light from the one I am supposed to approach it from for our magazine.

So here goes and if you don't like what I have to say just tear it up and feed it to your famous waste paper basket and work all night to get some material together to fill the space you have reserved for me.

Down there in Hollywood, one cannot pick up a daily paper, walk along Hollywood boulevard, attend a meeting of any kind or even sit at a table at Henry's (and I imagine that things haven't changed during the week I have been away), one cannot do any of these things or follow the routine of his daily life, without reading, hearing a little matter of interest and a lot of nonsense on the "talkies" and without being questioned on their past, present and future, just because the fact of being the technical editor of THE AMERICAN CINEMATOGRAPHER seems to invest one with a world of knowledge, with the power of regulating the motion picture business and of being an all seeing, an all divining sort of a sphynx who can unveil the past, explain the present, prophesy upon the future and give astonishing information to a news-hungry crowd.

Even the technical editor of this lusty journal is but a human being trying to get something out of the handful of gray matter that God has given him, by connecting a few thoughts together and trying thus to arrange in a certain logical order a jumble of expressions each one worthy of consideration in itself, but quite useless and even misleading if not properly connected with the next idea, fact or technical limitation.

And all of this is merely to tell you, Si, that in my opinion the public at large and many people in the industry, are rambling far and wide on the question of the "talkies" and it seems to me that a too great stress is given to the FUTURE and, except by a mere handful of technicians, very little is considered which pertains to the PRESENT development of this new art.

And this development has been marvelous. So marvelous that this new art has SOLD itself almost overnight to the public in spite of its technical imperfections, in spite of the pessimism that always accompanies a new venture of any kind.

It seems to me that there are more worries about what will happen to such and such a star, instead of a great rejoicing for the truly beneficial effects that the combination of sound and pictorial movement is bestowing and will bestow upon humanity.

Let me tell you, Si, my candid opinion. THE TALKIES WILL NEVER SUPERSEDE THE SILENT DRAMA entirely, but they will have a life of their own, a niche in this great business of ours—more than a niche—a place by themselves as a complement of the motion pictures program and as a complement of the silent drama, by furnishing to it the proper sound accompaniment.

The silent drama's stupendous success was due precisely to its silence. Action, movement can reveal more forcibly, more accurately a story situation than the spoken drama can. The silvery screen makes you LIVE, truly LIVE in a few seconds a situation that would take many times that span of time in real life.

Why? Because every move is carefully analyzed so as to dispense with all nonessentials; because the system of editing the film, this so important art within our art, has been so perfected that LIFE is represented in its essentials and in its essentials only; because a screen drama is nothing but the quintessence of LIFE, a sequence of climaxes which rivet the eyes of the spectator to the screen and HOLD THEM THERE.

Our public has learned to read pictures—has learned to pulsate in unison with them; he has learned to divest his thoughts of all the unnecessities of story-telling, and has furthermore accepted the clever, snappy, brief, but completely descriptive title which replaces the action, when the action becomes sluggish. Consider all the titles in one of several pictures, consider every one of them—good titles, poor titles, indifferent ones and try to figure out what action would replace them. You will always find that the poorest title is preferable at that point to the long drawn-out action that would be necessary to fully replace it.

The reason for this? Because the motion picture is above all a visual representation; because, as a visual representation its main function is to stimulate our thoughts and therefore permit us to interpret it according to our own personality. A charming and extremely intelligent lady told me sometime ago: "I love motion pictures because I make the actors talk as I WOULD WANT THEM TO TALK on that particular occasion," and this is the greatest of the privileges that the silent drama possesses it dictates to an audience a series of connected thoughts and let the audience adapt them to its own mentality and understanding.

Consider now a talking motion picture, I mean, of course, a full length program picture and try to visualize its rendition by means of dialogue. The picture matter, let us call it the VISUAL entity of the picture, would be subordinate to the dialogue, the SOUND entity. The whole tempo (excuse me for the use of this expression) of the picture would be lowered, its action would lose its greatest asset, the afore mentioned elimination of nonessentials.

And the eye confined to the surface of the screen would have to absorb a lot of lost motion in order to give the ear the opportunity of absorbing the essentials of sound, and this would happen in an ambience where the eye has no other alternative but to absorb all of the unnecessary motion, because of the darkness of the auditorium which is a primary condition for the presentation of the visual entity of motion pictures.

In a stage presentation the eye may rest from the stage upon any other part of the auditorium without the ear being distracted from the sound presentation and this is perhaps a subconscious, but very real relief. Besides, the stage play presents the elements of depth and color and REALITY of character, which do not belong to the screen. In spite of all our efforts, the screen is still handicapped by certain mechanical aspects which are in constant conflict with a too near-to-nature presentation. In spite of the thoroughness with which a motion picture is made to appear "naturally true to life" it is nevertheless only a picture and to make a picture talk continuously seems unnatural and even distasteful.

To return to the matter of ambience. I was the other night sitting in good company on the veranda of the lodge, overlooking the lake. It was a marvelous moonlit night and my companion, a writer of repute, was a witty and extremely interesting conversationalist.

We were talking about innumerable little nothings, trying to reform the whole world by ourselves. Carried on by his thoughts, inspired perhaps by the solemn quiet beauty of the night, my interlocutor gave free reign to his expressions, and talked, and talked and talked on literature, on psychology, on methaphysics, and his voice was coming to me as a caress while my eyes were roving over the surrounding hills, the ripples on the water illuminated by the moon rays, on the silent path disappearing in the depth of the night in the woods. He kept on talking for over an hour without interruption on my part and I can clearly remember almost every word that he said and also I have clear in my mind the soothing picture of the lunar landscape. I still feel the refreshing impression of rest imparted to my physical self by those truly enchanting hours. Will we ever be able to give this impression by the "talkies?" Not now. Perhaps in a distant future. But this will require the forming of new thoughts; a more complete and more abstract understanding of our own selves; an evolution which cannot be but slow in its accomplishments.

The movies, as we consider them now, are a fast going, high stepping medium of expression, very much in consonance with our age of swift advance of feverish progress and are one of the most suitable means of relaxation in keeping with such an age, just because of their individual prerogatives which I would term as thoroughness in speed. Take their fast moving qualities from them and you will not have motion pictures any more. I venture to say that motion pictures are too well anchored in our life as part of our customs and habits that they are too close to ourselves, too much in unison with our mode of living, to be entirely replaced by a means of expression which is entirely different, though it is closely allied to them.

I should never forgive myself if through my chatter I should convey to you the idea that I do not believe in the future of the "talkies."

I do firmly believe in them and no one is a greater admirer of their accomplishments and possibilities.

I shall never forget as long as I live, the most wonderful evening I spent in the projecting room as a guest of the Fox Studios. I shall never forget the impression I received in SEEING and HEARING during two hours of projection of Movietone, President Coolidge and Lindbergh, Mussolini, Marshall Foch and General Pershing, the Prince of Wales, Lloyd George, Thomas Edison, besides a score of musical interpretations and a couple of sketches—an unforgetable evening, I assure you.

This seems to be in contradiction to what I said before about the slowing down of motion picture presentation, but I shall here make a distinction between such subjects which more vividly RECALL to your mind subjects you have already known, actual facts of importance in our every-day life, and subjects of fiction which constitute but a passing impression upon your mind.

Yes! The talkies are and will always have a marvelous success in their own sphere and if THEY DO NOT ATTEMPT to SUPPLANT the silent drama and its vivid, terse mode of expression.

Fiction will also be presented by the "talkies," but a fiction of its own creation. A new school will arise and short subjects of fiction, especially subjects expressing THOUGHTS more than ACTION will be a fitting and elevating complement to the silent drama.

A new school forming technicians, writers, directors, and actors who will specialize in the "talkies," devote all their thoughts to them, and finally bring about that perfection of execution more essential in this mode of expression that it has ever been in the silent drama.

But their brevity will be one of their outstanding qualities—brevity and pictorial art. The first to avoid sluggishness of tempo, the second to keep the eye interested in the screen at all times.

Other outlets will be the full presentation of stage successes, of operatic renditions and of the so-called "eye and ear" entertainments, presented to the public with all of the technical staging advantages that the screen has over the legitimate stage.

This is what I can forsee the "talkies" will do in their own production field, for the amusement of humanity.

Besides this it has been proven already that they are the most suitable, most logical complement to the silent drama, as sound accompaniment.

Perfect music scores and sound effects, lend beauty and effectiveness to all motion picture productions and the modern pictures will, thanks to the "talkies" accompaniment, be presented in a more perfect and more proficient way than it is possible to present them now with the most masterly conducted orchestra and such presentation will be the same in the most palatial million dollar auditorium as in the most humble theatre in the most hidden away little hamlet. And this is progress, real progress, beneficial progress which generously distributes its blessings to the whole of humanity, the favored by fortune and the disinherited, the great and the lesser, and finally results in greater happiness, in greater consciousness of the reasons of our belonging to the human race.

And I also think of the great advantage that the "talkies" will be to Science and Education and of the greater understanding that such medium will bring about among the different nationalities. It should be one of the greatest factors in Universal brotherhood—and, why not be a trifle prophetic—it may become the medium by which utopia may become reality, by proving, dictating the necessity of a universal language—and finally bringing about this accomplishment which would be the greatest step ever taken towards the establishment of sempiternal peace.

And talking about languages brings me down to earth and reminds me of the question often brought about, on the possibility of showing the "talkies" in foreign countries. I venture to say that fiction dialogue talking pictures will not be successful in countries of foreign languages. The suggestion of making special sound records for the different languages and for the same picture record is thoroughly impractical, because of the impossibility of the synchronization of the movement of the lips with the sound, and the inherent, obvious and too great limitations of the translation in another language thusly imposed. But I am going to be prophetic again, America and England will supply the English speaking word which is sufficiently great to take care of production in large scale. South America and Spain will see the motion picture industry develop and grow as a national great industry, the Spanish language being the second spoken by more people on earth, and it will remain to France to express the most elevating, most artistic, most delicate, most literary thoughts, because French is spoken throughout the world by the most apt to appreciate these refinements of culture. Here is a glorious future for France, a task that should make this great nation proud of the opportunity that science and progress offers her, to keep the leadership in the intellectual affairs of the world.

But now, dear Si, the hour is getting late and I have to get up with the sun in the morning to go trout fishing. Instead of writing you an article, I wrote you a letter —I am not even going to re-read it before mailing. I want you to read it, get some sense out of it, if you can, and following my thoughts, EDIT it for publication. This is part of your punishment.

Cheerio,

JOE DUBRAY.

The New General Electric Talking Movies

By James R. Cameron

To the casual observer the talking film does not differ from the usual motion picture positive. It is of standard width, but along the left margin there is a strip a small fraction of an inch wide on which is a series of horizontal light and dark bands and lines, of varying widths and intensities. It is this series of bands and lines which produces the sound. The film is passed through the reproducer at constant speed, and, as these light and dark bands pass rapidly before a tiny slit in an optical system, the amount of light is varied. The ever-changing amount of light is received by photo-electric cell—the electric eye—which is extremely sensitive to any change in the amount of light striking it. The more light received, the more current it will permit to pass through its circuit. This current is amplified and changed from electrical to audible energy by an amplifier and speaker.

Among the features of the new apparatus are that both the picture and sound records are on the same standard motion picture film, and that a standard motion picture projector, with an attachment for the sound reproducer is used. Since the picture and sound records are printed side by side on the film, it necessarily follows that the two must be properly timed or synchronized at all times—it is not possible for the picture to break and the sound to continue, or for the sound to stop and the picture to continue.

There are three principal elements in the apparatus, including a standard motion picture camera, a sound recorder and a standard motion picture projector with a sound re-producing attachment all driven by synchronous motors. The pictures themselves are made in the usual way on standard film.

In recording the sounds, a microphone or sound collector of any desired type is employed, together with amplifiers. The microphonic system actuates a tiny vibrating mirror which records the sound on the film as light and dark bands, the light from a small incandescent lamp being reflected by the mirror through a tiny slit in the optical system in front of the film. The higher the pitch of note, the higher its frequency, and the greater the frequency of vibrations of the mirror which faithfully reproduces each sound vibration as a mark on the film.

The sound record can be made in different ways. Both the picture and sound can be simultaneously recorded on the same film by mounting the two recording elements as a unit, with the sound recorder uppermost. The two recorders can also be mounted separately and the sound and picture film negatives made as individual units, such an arrangement being preferable when the pictures are being made in studios and when the camera is being shifted constantly. Again, as in the case of accompanying music, the picture film can be entirely finished and titled, the record of the music then being made on a separate film and the two combined on the finished positive.

The sound re-producing attachment which is connected to the standard motion picture projector consists of a photoelectric cell behind the film and a small electric lamp with suitable optical arrangement in front of the film. As the film passes a small slit, similar to the one used in making the sound record, a varying amount of light is admitted to the photo-electric cell, the amount of light depending on the photographic density on the sound track. The result is that a very minute and varying current, an exact replica of the sound wave, is produced. The tiny current is amplified and led to a loud speaker which reproduces the sound in sufficient volume to fill the auditorium. Any suitable loud speaker may be employed.

Examine one of the films carefully. Here is the usual series of pictures of actors and actresses. At one side of the picture is a strip of bands. Some of the bands are fairly dark; others are light; still others are nearly trans-

(Continued on Page 36)

DE VRY - - -
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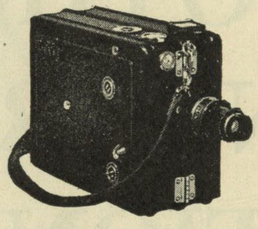

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HENRY SHARP
Cameraman in the Black Pirate and Anna Christie.

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Edward O. Blackburn, Vice-President and General Manager

FOX CASE CORPOR

By Earle I. Sponable*

* Technical Director, Fox Case Corporation, New York, N. Y.

Transaction S. M. P. E.

I.—Introduction
II.—Description of Movietone System
    A—Recording
        Studio
        Microphones
        Amplifiers
        Aeo Lights
        Slit Units
        Camer
        Field
    B—Processi
        Develo
        Printi
        Develo
        Cuttin
    C—Reprodu

The general subject of the making and showing of motion pictures in synchronism with sound has recently been covered by papers presented before this society at the last two successive meetings, and also in recent articles appearing in many of the current trade and scientific publications. The conception of the idea of sound motion pictures is not new but practical commercialization of the art has been dependent upon the perfection of sound transmission apparatus and the solution of problems relating to various vital parts of the whole system.

In this paper it is intended to cover briefly the making and presenting of the Fox-Case system of sound motion pictures, tradenamed "Movietone," and to emphasize various parts of the process peculiar to this system that have not previously been described.

The theatrical success of any system of sound motion pictures is destined to bear a definite relation to its practicability and to the faithful reproduction of sound without embellishments or special qualities added to the original. The theatre is especially critical of this last named condition inasmuch as the audience must hear the reproduced sound over a period of time, and any distortion will cause a very tiring effect upon the listeners. The novelty of "talking pictures" is past. Now unless the illusion is so very real that the hearers are unaware of the process involved, the system will surely be doomed a failure.

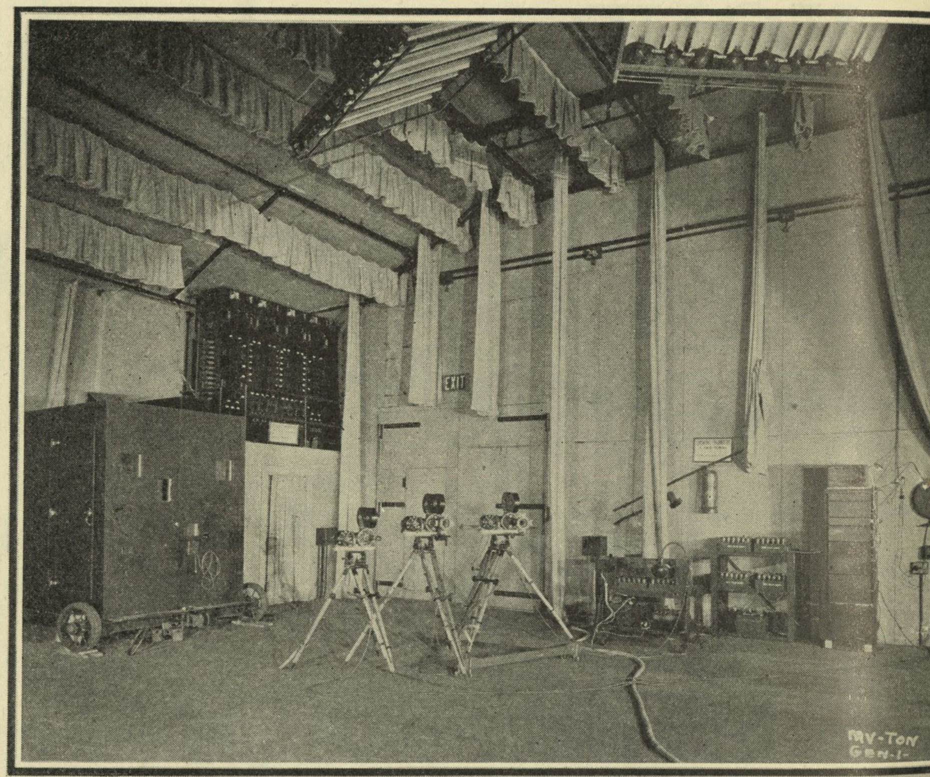
The making of Movietone pictures is carried out in three general steps; namely, recording of the sound and picture, processing of the film, and reproducing.

Recording

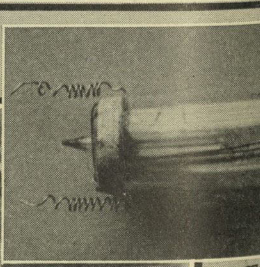
Whenever sound is recorded in an enclosed area usually two conditions have to be satisfied. These are the exclusion of foreign noise necessitating sound-proofing of the studio, and reduction of room resonance or echo.

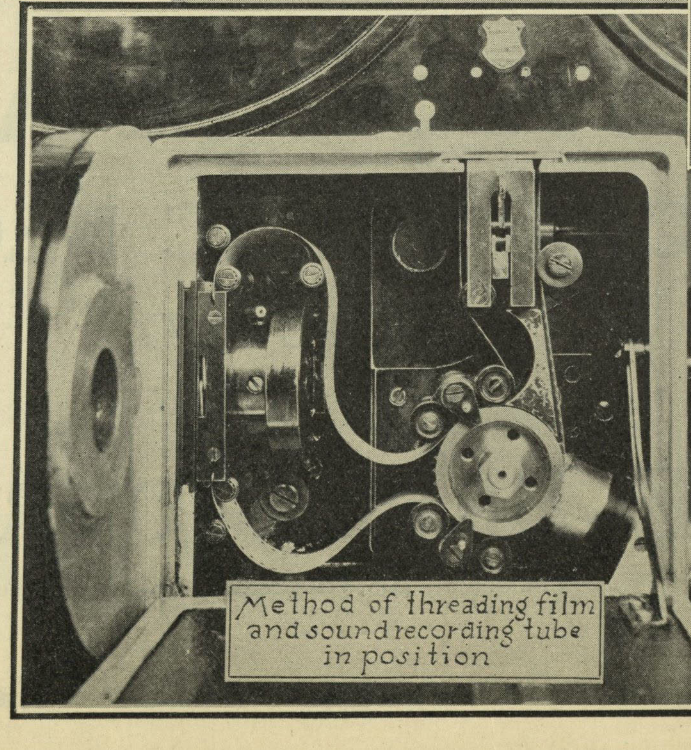
The present recording rooms at the Fox-Case Studios were designed from experience gained in the construction of three previous experimental studios, the study of some of the modern broadcasting rooms, and through experiments relating to acoustical materials.

It was decided that at least two separate recording studios were necessary. These rooms were constructed sound-proof from street noises and from each other. It is possible to have sets being prepared on one stage while record-



Cloth drapes for controlling resonance in recording room





Method of threading film and sound recording tube in position

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OUTLINE

Outfits
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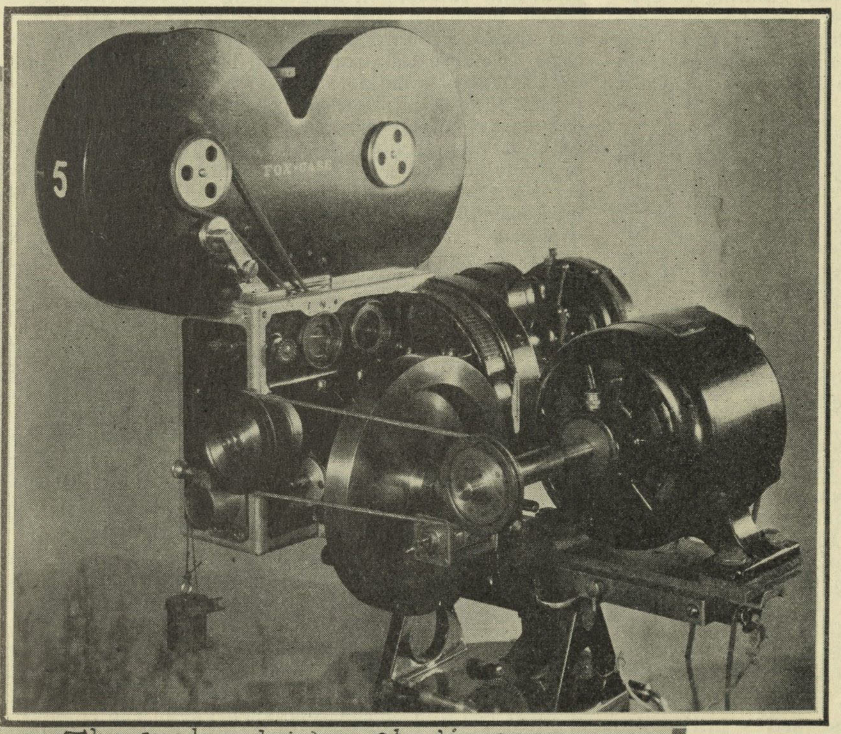
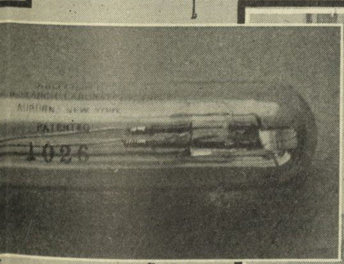
Projector attachment
Photo-electric Cells
Amplifier
Screen
Loud Speaker
Theatre Acoustics
Projectionists
III.—Uses of Movietone

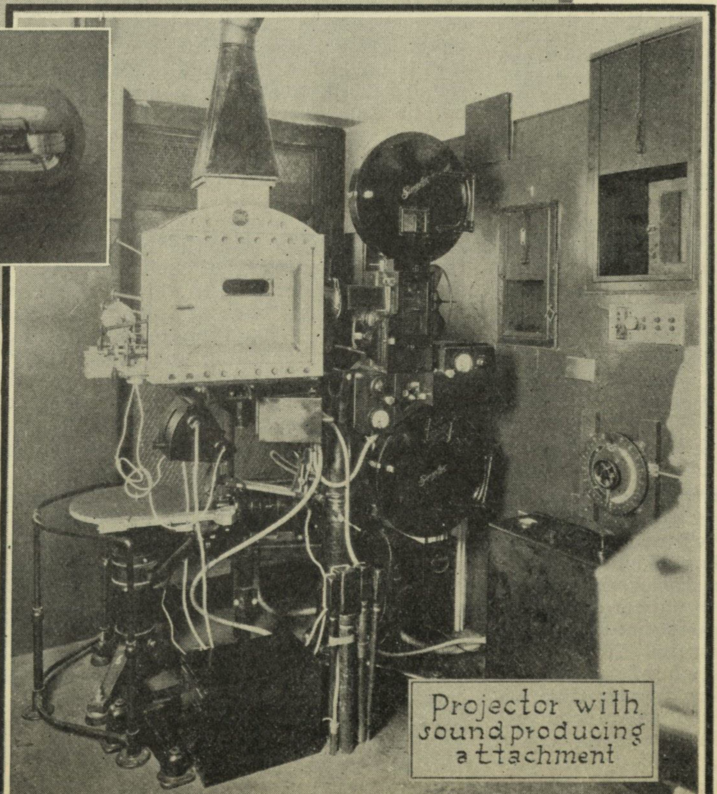


The motor-driven studio camera



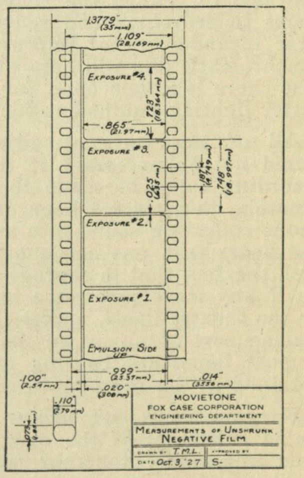
he Aeo Light

1—Upper Left
2—Center
—In text at Right
4—Upper Right
5—Lower Left
6—Lower Right



Projector with sound producing attachment

ings are being made on the other. The sound-proofing is accomplished either by using very thick masonry walls or by using a double wall with an air space, and a sound absorbing material within. The inner walls of our studios are made using four-inch solid gypsum block, one inch of hair felt, three inches of air space, and another four-inch solid gypsum block wall. These walls are started about six inches down in the concrete foundation. The outer walls are made of brick and masonry and are about twenty-four inches in thickness. A double ceiling is supported from the roof trusses. It is made of concrete plaster and separated by a three-inch air space and one-inch hair felt. The floors of the studios are covered with soft carpeting. The inner walls and ceilings are covered with Celotex and further damped by hanging heavy Monk cloth drapes perpendicular to the walls and ceiling. These drapes are arranged for raising and lowering so that the degree of resonance may be varied to meet different conditions of recording.



This special arrangement of damping here shown was found to be equivalent to covering the walls with three or four inches of hair felt and possessed the advantage over felt in that the absorption of the sound was quite independent of frequency.

A small and a large stage have been equipped in the manner described above. The small stage is 22 feet wide by 56 feet long by 21 feet high, and is highly damped. This condition is used mainly when recording speech. In the case of musical numbers, a certain amount of resonance is preferable. Such conditions have been satisfied in the larger stage which is 50 feet wide by 80 feet long by 21 feet high. The size of this stage permits the erection of sets for practically all types of present picture requirements. It is also used in recording the musical scores in synchronism with regular pictures. In this work the picture is projected on a screen from a sound-proof booth and the conductor of a selected orchestra follows the pictures synchronizing such special effects as the score requires, often incorporating many things that promote the proper presentation of the picture and which would be difficult even in the larger theatre orchestras, and practically impossible for the smaller theatres. The sound from the orchestra is recorded on a film running in synchronism with the projection machine. The sound negative so obtained can then be developed and combined with the regular picture negative, to make positive prints having the Movietone scoring on the same film adjacent to the picture.

Those of you who ever visited a broadcasting studio in summer will undoubtedly remember the Turkish-bath effect which is secured in insulating for sound and the resultant retention of heat therein. In designing the Fox-Case Studios, considerable thought was given to the problem of ventilation. The problem was more complicated than the usual ventilation problem, due to the necessity of excluding blower and machinery noises. The air in the present studios is conditioned and is completely changed every eight minutes. The temperature and humidity of the rooms are controlled and held proper for maximum comfort. This installation has proved well worth while in obtaining a higher efficiency from both artists and working personnel. This is especially noticeable in the picture scoring work where large orchestras are playing over a period of several hours a day.

The picture lighting used in the sound studios is similar to that employed in regular motion picture work. Both hard and soft lights are used. In some cases it was found necessary to quiet down the operating mechanisms and also to change the reflectors in the Cooper-Hewitt lamps to prevent sound reflections. It is probable that later incandescent or improved lighting equipment and panchromatic film will help solve noise problems. In any case there is a field open for the manufacturer to make better lighting equipment for use in sound picture work.

All of this work of adjusting acoustics in studios would not be necessary if the sound collectors used in recording could be made to act like our ears. Unfortunately, this has not been done, and we find the microphone collecting sound in a manner quite similar to what one hears with one ear alone. This condition, together with the fact that in reproduction we usually require little if any more resonance in addition to that possessed by the theatre itself, makes the technique of microphone placing sort of an art in itself, and something that has a most important bearing on the illusion that will be obtained in the reproduced sound.

For our work, we prefer to employ in most cases, sound collectors of the electrostatic or condenser type. This apparatus, together with the auxiliary amplifier equipment necessary to increase the electrical energy picked up by the microphone corresponding to sound variations to a level necessary to operate the recording mechanism at the film, is practically Western Electric standard Public Address equipment. This has already been described to you by Mr. P. M. Rainey in his paper on the Vitaphone, "Some Technical Aspects of Vitaphone" Trans. S. M. P. E. No. 30, 294, 1927.

In recording it is necessary, of course, that the microphone either be placed outside of the camera field, or masked. The intensity of sound varies inversely as the square of the distance, thus the problem of suitable position of the microphone is of utmost importance, especially when recording weak sounds. In recording large orchestras and complex musical organizations the balance of sound must be carefully adjusted through the use of a Monitor system. This system of monitoring is a replica of the standard reproducing system, thus enabling one to judge at all times how the reproduced record should sound. In some recording work we use a number of pick-ups, combining and adjusting these currents through the use of a mixing panel.

Two methods of changing the electrical variations corresponding to original sound into variations in light intensity and subsequently exposure of the photographic emulsion are being successfully used in Movietone recording. One of these consists in modulating what is known as a light valve. This is a development made at the Bell Laboratories and is similar to the device described by Dr. H. E. Ives in "Transmission of Pictures over Telephone Lines," Bell System Technical Journal, April, 1925. Its use in connection with sound recording will be described in detail in another paper. The other method involves what is termed the flashing lamp principal and consists in modulating an electrical discharge taking place between electrodes in an actinic gas. This gas discharge device is a development made at the Case Research Laboratory and is termed "Aeo" light.

It is fairly simple to make a glow lamp but to make a light that will follow all the intricacies of the different sounds from the faintest to the loudest, and do this without distortion, and further give sufficient light to properly expose a photographic film, has proved an interesting problem. Thus far the "Aeo" light has proved most satisfactory for this purpose. This light is shown in Fig. 2. It consists of a glass or quartz bulb about 1⅛ inches in diameter and 6 inches long. Two electrodes are mounted close to the rounded end of the bulb. One of these electrodes, the anode, is usually made of sheet nickel about ⅛ of an inch wide and ¼ of an inch long. This is mounted opposite a U-shaped cathode of platinum coated with a mixture of alkaline earth oxides. During the manufacture of the light the oxide-coated loop is activated and a gas consisting mainly of helium is placed in the bulb at a pressure required to produce a concentrated glow about the cathode under an applied potential of about 350 volts and a current of about 10 milliamperes.

In use for sound recording the "Aeo" light is maintained luminous by an exciting battery. Sound currents are superimposed on this luminous discharge, causing it to modulate and vary in intensity in accordance with the original variations.

To print the sound image on the negative film the "Aeo" light is inserted in a tube carrying a quartz slit mounted on a mechanical float which presses very lightly against the film at the feed sprocket in the camera. The development of this slit was a very important step leading to the making of commercial sound records. The early inventors attempted to use a slit made up of metal knife edges. This was impractical due to the fact it could not be made sufficiently accurate for good sound recording and when placed against the film could not be kept free of dirt. The present slit consists of a small piece of quartz about 0.2 inches square and twenty mil in thickness. One surface of this piece is coated with a silver film and a slit ruled in this film having dimensions of .10″x.0006″. A cover glass is then cemented upon the silver and this cover glass polished down so that the thickness of the cover over the slit, including the cement, is less than one one-thousandth of an inch in thickness. The "Aeo" light is mounted directly back of the slit and as close as physically possible. This type of slit has been successfully used for both recording and reproducing. It is now being superseded by an optical slit wherein the image of the slit ruled on the silvered quartz is focused upon the photographic film.

The sound is recorded on standard negative film adjacent to the picture. Fig. 3 shows the dimensions and location of this record. The speed of the film during recording is ninety feet per minute.

Whenever possible during the development of this system it is realized that the use of a standard equipment has much to recommend it, and this is especially true in the choice of camera equipment. The present Movietone camera was developed from the Bell & Howell motion picture camera. The advantages of this camera for picture making have in a large part been retained. Arrangements have been made for the insertion of the sound recording attachment to print the sound on the feed sprocket. In order to obtain uniform velocity of film at this point and quietness of operation, it has been necessary to install precision gears and make all internal parts with the most exacting mechanical accuracy. A fly wheel has been placed on the sprocket shaft and mechanical filters incorporated to produce uniform motion of the sprocket. In the studio the cameras are driven by synchronous motors. For portable work, 30-volt, direct-current motors are used with rheostat control operated from storage batteries, or by special spring motors controlled by a governor similar to phonograph motors. Fig. 4 shows a general view of a motor driven studio camera. Fig. 5 shows the method of threading the film and the sound recording tube in position.

A complete field recording outfit consists essentially of a microphone, a special amplifier containing a volume indicator, an "Aeo" light circuit and a special sound camera. Power for the amplifier is supplied by a 12-volt storage battery and a 400-volt dry cell B battery. The outfit is transported in a ¾-ton automobile truck and manned by a crew consisting of a camera man and a sound man. The apparatus has been simplified to such an extent that the recording work in most cases is being done by men having no special technical training. It is important, of course, that all recording equipment be inspected at regular intervals. To this end a department has been established to service and make gain measurements on the apparatus regularly.

A number of these outfits are in operation at the present time both in this country and abroad. It is intended within a short time to cover the world for Movietone recording in the manner that the silent news motion picture is covered now.

The wide open spaces give acoustically ideal recording conditions. It is probable that in making Movietone feature pictures the outside recording will be done by a portable outfit and that the lot will be located in some quiet section away from the noise and din of the city.

Processing

The processing of the film is being carried out in our regular commercial laboratory. The negative is developed by rack and tank method for normal time in a fine grain developer. The printing of the positive is at present accomplished by standard Bell & Howell semi-automatic continuous printers of the back shutter type. These are modified by installing masks at the printing aperture to allow for covering the sound track while the picture is being printed and vice versa. The negative and positives are then run through the printer twice. In printing the sound is shifted with reference to the picture to provide proper synchronism on projection. In the camera the distance from center of picture with the intermittent about to move to the sound slit is 7¾″; the sound slit being on the take-up side. In the projector this distance is increased to 14½″.

It is only recently and with the co-operation of the Eastman Kodak Research Laboratory that we have begun to actually investigate the effect of photographic processing upon the quality reproduced sound. Some very interesting results have already been obtained. One of the things that bothered in the begining of the sound recording work was film noise or ground noise. This was at first thought to be inherent in the base or emulsion of the film itself, but it has recently been shown at the Eastman Laboratory that perfectly clean film will reproduce practically without noise. If, however, the film is handled and rewound in the open, dust particles adhere to the film and ground noise appears. This means if the film in recording and processing is kept clean, that practically the only film noise that will be present on the print will be due to the dust and abrasion on the positive. By properly setting of the recording level, this noise will be so low in comparison with the reproduced sound that its presence will be practically unnoticeable in the theatre.

In the developing of the positive and negative films, it has been found that contrast and consequently the quality of the reproduced sound follow the conditions necessary for good picture reproduction, namely, that the product of the negative and positive gammas be nearly unity. Fortunately for commercial purposes these limits are not particularly narrow. It is more important for good quality of reproduction that the transmission of sound record be correct. All laboratory work is gradually being placed on a mechanically and scientifically controlled basis. This will not only promote the production of better sound records, but will also improve the picture value as well.

Recording the picture and sound upon the same film make it possible to cut and edit the film in a manner very similar to that used in still pictures. Either the positive or negative can be handled in this manner.

Reproducing

The process of reproducing the sound from the Movietone film consists essentially in moving the sound record through a linear beam of light. The modulations in the form of sound lines on the film vary the light beam in accordance with the recorded sound. These light variations falling upon a photo-electric cell produce corresponding electrical variations which may be amplified and changed back into sound variations at the loud speaker to give the reproduction of the original sound.

Fig. 6 shows a theatre style of Movietone attachment for reproducing the sound. This type has been designed to be applied to the standard Simplex projector and is placed between the head and the lower magazine. It consists of an accurately cut sprocket used to move the film at a uniform velocity through an aperture plate and tension shoe. A 25-watt, 12-volt straight coil filament lamp is focused upon a slit 1.5 mil wide. The image of this slit is then focused upon the sound track on the film at the aperture plate, giving a rectangle of light .080″x .001″. The modulated light passing through the film falls upon a potassium photo-electric cell. This cell is connected to a three-tube resistance coupled amplifier which is, in turn, coupled to a Standard Public Address amplifier system and loud speakers. Uniform motion of the sound sprocket is obtained by placing a rather heavy fly wheel on the shaft supporting the sprocket and driving the shaft through a damped spring mechanical filter system by a tuned motor generator drive.

For the demonstration to be shown in the smaller theatres a simplified attachment is used. The tuned motor generator drive is replaced by a synchronous motor or a direct-current motor with rheostat control. The motor is belted to the fly wheel of the attachment by an endless cord belt which serves as a mechanical filter of motor pulses and does away with the spring filter mentioned above. The inertia of the fly wheel smooths out any gear inequalities that tend to reflect back from the head mechanism of the projector. In this simpler attachment a barium photo-electric cell picks up the sound variations and is coupled to the main amplifier through a one-stage amplifier.

A number of sizes and arrangements of equipment are available to take care of all conditions of projection from the largest theatre down to the smallest demonstration room. These are made to operate either on direct current or alternating current, as the conditions require.

The Public Address equipment and loud speakers used in reproducing have been fully described by Mr. Rainey in his paper on the Vitaphone. Theatres already equipped for Vitaphone can run Movietone by the addition of the attachment to the projector and a slight re-adjustment of the amplifier system.

In reproducing sound film it is, of course, necessary that the speed of the film be the same as that used in recording. The standard adopted for all Movietone film is 90 feet per minute. The fact that the sound and picture are on the same film means that synchronism and correct correlation of picture and sound are automatically taken care of. If the film is broken or parts are cut out, the sound and picture are equally affected.

For Movietone reproduction we have developed a special projection screen that is practically transparent to sound and yet possesses a satisfactory surface for the picture projection. This screen is made of bleached cotton yarn woven in a novel manner to allow the passage of sound without muffling and yet reflect a maximum amount of light. With such a material the loud speaker can be placed directly behind the screen, consequently producing the illusion that the sound is actually issuing from the point indicated by the action on the screen.

The loud speaker equipment consists of a sufficient

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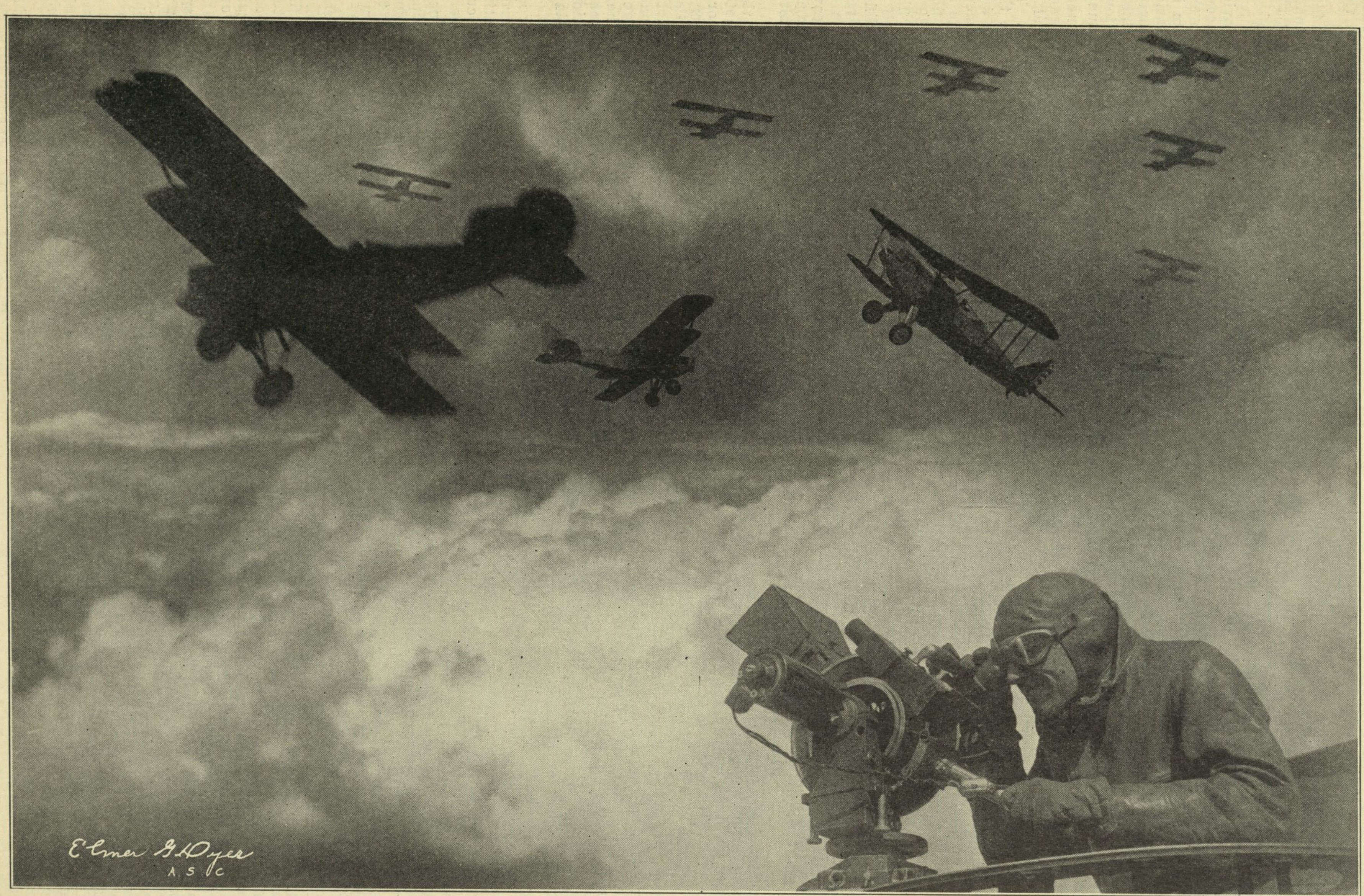

This remarkable picture gives an excellent idea of the thick of a fight in the air during the filming of a great aerial drama. At lower left may be seen Elmer G. Dyer, A. S. C., at his Akeley making his shots for all the world like a machine gun operator in real war. The picture shows plainly how the camera is mounted for air work. It is doubtful if a finer example of air still has ever been shot.

The War Baby of Cinematography

By ELMER G. DYER, A. S. C.

[Elmer G. Dyer, A. S. C., and an Akeley artist of note, broke into air photography in 1918 when Universal produced "The Great Air Robbery," featuring Omar Locklear, who met death later while making a thriller for Fox. This Universal picture was the first of the air feature pictures, according to the belief of Mr. Dyer. His most recent engagement was with the Fox special, "The Air Circus," directed by Howard Hawks, Dan Clark, chief cinematograpaher. On this picture Mr. Dyer made all the Akeley shots. At present he is employed by Caddo on "Hell's Angels," which promises to be one of the outstanding pictures of all times.—EDITOR'S NOTE.]

Away back in 1917 there was born to the world of Cinematography a little fellow who looked so strange and fey that few of the pioneers in the industry gave even a second thought regarding its future. It was a round little fellow with two great eyes, and supported its strange self on thin, spindling legs that seemed too frail to support anything of consequence.

Its papa, Carl Akeley, had dragged it around the jungles of Africa so long that everyone thought it would never be good for much of anything outside of chasing wild animals.

Along with thousands of American boys who went to war in 1917, was this newcomer to cinematography, Mr. Akeley's strange little fellow, the Akeley camera.

To make a long story short, the little Akeley was dragged around some more. Not by its papa this time, but by a lot of news cinematographers who didn't take such good care of it as its parent was wont. It went bravely through a couple of years of mud, rain and salt water and came out smiling in 1919 with a lot of professional friends in New York and Hollywood.

Like all good things, the Akeley camera came at last to Hollywood, where some of the cinematographers who remembered its army record, tried it out in professional airplane photography, and from that day its career was assured.

Today the Akeley camera stands without a peer in the field of airplane movies. Scarcely a single air picture of any consequence has been made recently without the frequent use of this camera. Chief among its advantages over other types of cine cameras for airplane use is its full-floating "gyro" control for movements both up and down and from side to side. This control is not only smooth and steady, but is also unbelievably quick and accurate.

Now it is not always easy to mount the ordinary professional movie camera to advantage on an airplane because of the extremely limited space available. The Akeley camera is head and shoulders above them all in this respect for it is light of weight and so built that it may be mounted in several positions in the average fusilage while allowing ample room for the operator to work efficiently.

For airplane work the tripod is dispensed with, and the camera mounted on a flat base which in turn is securely bolted to a "saddle" in whatever position is required for the scenes to be photographed.

However, with the introduction during the past few years of many varied types of airplanes, an adjustable "saddle," or camera support, was found necessary. Briefly, this accessory is so constructed that it is suitable for any moderate size cockpit which has sufficient space to allow the cameraman either to stand erect or kneel on the passenger chair.

The general idea of this contrivance was borrowed from the circular track used in mounting machine guns on airplanes. This track forms a circle around the cockpit just above the fusilage. The Akeley camera is re-

(Continued on Page 29)

ELMER
G.
DYER,
A.S.C.

Specializing in Akeley Aerial Photography; Pictorialist; Miniatures; Tricks; Cartoons.

Some Akeley Engagements

"THE GREAT AIR ROBBERY," with Locklear
Universal

"FAST AND FURIOUS"
Universal

"THE AIR CIRCUS," working title. Hawks Production-Fox. Dan B. Clark, A. S. C., Chief Cinematographer

"HELL'S ANGELS," Caddo
Harry Perry, A. S. C., Chief Aerial Photography

"PAUL JONES" Fox

"UNCLE TOM'S CABIN"
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Akeley Camera Equipment Especially Designed for Air Work.

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Elmer G Dyer

Shoot color with panchromatic light

WHEN the scene is colorful, shoot it with the light from National Panchromatic Carbons, using panchromatic film. These carbons produce light that is matched accurately to the film, and the result is correct tonal reproduction of the various colors.

National Panchromatic Carbons offer the additional important advantage of economy. They provide more photographic light per watt of electrical power than any other light source, except only National White Flame Photographic Carbons, and more visible light per watt than any other light source.

Both National White Flame and Panchromatic Carbons are interchangeable in your present arc lamp equipment

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"A Study in Acoustics"

By J. B. ENGL

(Continued from Page 14)

above or below the screen, often gives the impression of the actors speaking with their feet, or of voices coming from heaven. This too is the reason for using sound reproducers with little or no directional effect. The ideal solution is to place the loud speakers in the area of the screen. This can be done in case of horn-type instruments by placing them behind the screen. A minimum loss in intensity can be insured by using a very thin sound-transparent screen material. Or still better, in case of loud speakers with diaphragms of large diameter, the diaphragms themselves can be part of the screen surface. A point sometimes to be considered in big theatres is the time required by the sound waves to travel from the loud speakers near the screen to the hearer. This time, of course, is different for different positions of the hearers and the question of exact synchronism arises. The obvious way to get satisfactory conditions is to synchronize in such a manner that hearers in the center of the room see and hear with exact synchronism. The differences in synchronism are then balanced in the best possible way. The sensitiveness of the human mind to lack of synchronism is quite great, a tenth or a twentieth of one second is comprehended readily by the hearer.

4. Best Acoustic Conditions for Recording and Reproducing.

A very good method of getting natural results has already been mentioned above. It is what I call stereosonic recording and reproducing. In part 2 the method of recording with a recorder similar in arrangement to the conditions existing in the human ears was explained. As we photograph with two lenses to get stereoscopic pictures, we record with two recording systems in two points of the sound field. And as we look at stereoscopic pictures with two eyes from a certain distance with the known stereoscopes, we have to reproduce the two stereosonic records with two reproducing outfits and loud speaker sets. Then we are able to locate sound sources in the theatre and we get an improved illusion of the sound coming from actors seen on the screen, or from an orchestra below and before the screen. Of course, the stereosonic distance can be greater than the distance of the human ears, and the effect thereby increased.

The next best method is to record with as little secondary sound wave effect as possible, as in the open air. The only reverberation effect then obtained is the resonance action of the reproducing room. Generally in theatre rooms too much reverberation exists and this effect is at least not over-emphasized. If a theatre room sounds too "dead," it is easy to produce some resonance effect by suitable arrangement of the reproducing units. In any case, the clearness of reproduction and the intelligibility will be good, which is of first importance.

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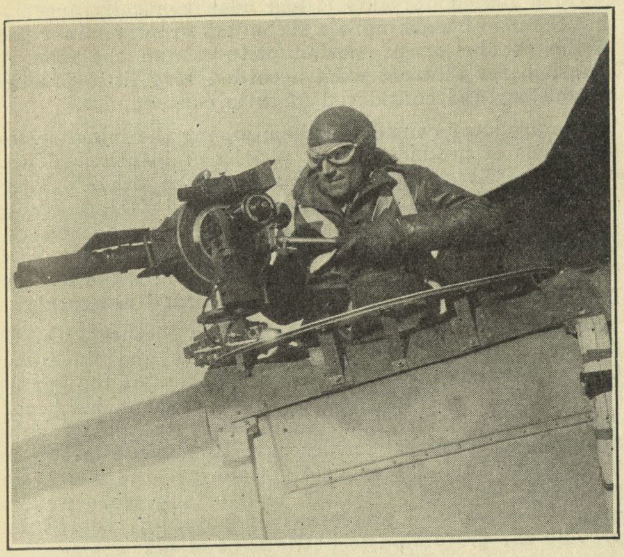
War Baby of Cinematography

(Continued from Page 27)



Elmer G. Dyer, A. S. C., at his Akeley, showing mount for air plane shots.

moved from its tripod and secured by its own base to a roller-bearing "tram" which in turn may be rolled into any position on the circular track and secured there by a quick-acting clamp. The Akeley operator works within the circle, adjusting his camera to any desired sector by means of the "tram." He then levels and operates the camera in exactly the same manner as though it were on its tripod.

In work which requires the Akeley operator to photograph from the front cockpit an adjustable camera shelf is hung over the side of the plane just outside the cockpit and secured to the fusilage by means of web straps. This shelf is reversible, thus permitting the camera to be placed on either side of the plane without delay.

Two accessories are also in general use on the camera when used in the air; the large direct finder and the cinemotor.

The large view finder is mounted directly above the photographing lenses and gives a matched range of focal lengths from 40 millimeters to six inches, which range about comprises the focal lengths practical for air work. This finder shows an image, right side up, with left and right correct, thus affording an easily accessible view finder which is used in conjunction with the eye-piece furnished on the Akeley. In extremely fast planes, or when the camera is mounted in exposed positions, this finder, however, is not practical because of wind resistance.

The cinemotor is adapted to the Akeley for the purpose of steady shutter operation under conditions which would give only mediocre results if the hand crank were to be relied upon. Severe wind resistance encountered in planes traveling over 100 miles an hour makes steady hand cranking almost impossible. Not only does the cinemotor operate the shutter under adverse conditions in the air, but it allows the camera to be placed in more exposed positions, and also makes possible the use of two hands upon the control bar. Two hands available for the control bar means a big advantage when the camera is being operated from an airplane where the quick release of the gyro control cannot be accomplished otherwise, without taking one hand off the crank, thus stopping action and in known instances resulting in failure to register important scenes.

Probably the most troublesome detail of operating a movie camera from a plane is encountered when reloading the camera with fresh film becomes necessary while in the air. This is quite feasible with the Akeley for two

(Concluded on Page 34)

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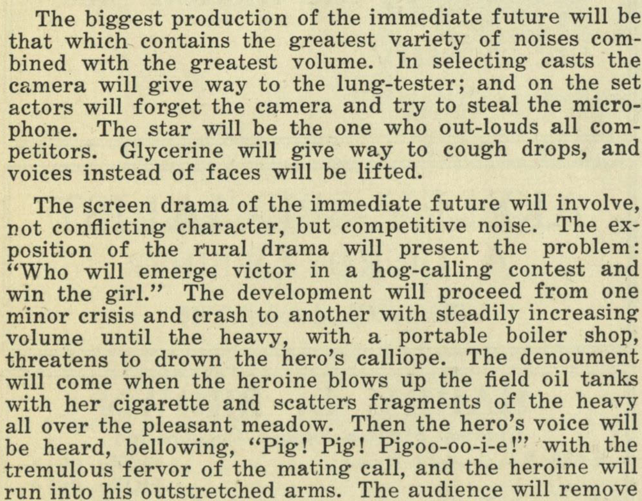
Talkies from the Writer's Angle

The vitaphone and movietone will put the actors who can't act without music and the directors who can't direct without megaphones on the shelf beside the cigar store Indian, the pug dog, the gold tooth pick and the mustache cup. Dumb actresses must acquire the power of speech, and vociferous directors must cultivate the sign language. Everything now speeding in high gear will be suddenly thrown into reverse, except the writing of the story, which will still be done in the cutting room after it has been shot. The pastime of taking small fragments of a picture and putting them together was invented by the puzzle editor of a daily newspaper to amuse children and morons. As it does not require ability to read and write, it is not to be compared with the highly intellectual occupation of working cross-word puzzles; and it is entirely wanting in cultural qualities, for it cannot enrich the vocabulary, stimulate the imagination and exalt the soul as it does to discover that the burden under which humanity groans is, after all, only a simple little onus.

The noisies will turn from the printed word and appeal to the emotions through the ear, and our spoken language will be augmented by the audible equivalent of words which in cold type inadequately expressed dramatic contacts and emotions such as "Blam!" "Ee-e-k!" and "Squash." But, owing to the strict censorship imposed on pictures, an intrigued public will never hear and never know the exact sound represented by the mystic symbol, "D—n!" What a pity!

The biggest production of the immediate future will be that which contains the greatest variety of noises combined with the greatest volume. In selecting casts the camera will give way to the lung-tester; and on the set actors will forget the camera and try to steal the microphone. The star will be the one who out-louds all competitors. Glycerine will give way to cough drops, and voices instead of faces will be lifted.

The screen drama of the immediate future will involve, not conflicting character, but competitive noise. The exposition of the rural drama will present the problem: "Who will emerge victor in a hog-calling contest and win the girl." The development will proceed from one minor crisis and crash to another with steadily increasing volume until the heavy, with a portable boiler shop, threatens to drown the hero's calliope. The denoument will come when the heroine blows up the field oil tanks with her cigarette and scatters fragments of the heavy all over the pleasant meadow. Then the hero's voice will be heard, bellowing, "Pig! Pig! Pigoo-oo-i-e!" with the tremulous fervor of the mating call, and the heroine will run into his outstretched arms. The audience will remove its ear muffs and recover its hearing in time for another show the next night.—Screen Writers' Bulletin (Hollywood.)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LOS ANGELES

The M. P. M. A. A.

By Vernon Murdock

For a period of years it had been generally accepted that the art of make-up is a secondary or very minor part in the production of motion pictures and the men responsible for that art were accorded very little prestige or courtesy and considered of little consequence.

The producer considered them among the minor necessary evils of production, not worthy of mention. These men themselves looked askance at each other. There were petty jealousies, rivalries and bad feeling among them. One would say that the cosmetics made by one concern were the only ones that could be used to produce the desired effect for the profession, while another would swear by a different type and brand altogether.

On the 8th of May, 1927, the Motion Picture Make-Up Artists' Association came into existence and since that time under the guidance of those members of the profession who have spent a life-time of experiment, hard, conscientious, thankless labor and money in the effort to achieve success, great strides have been made in the art of make-up in the past year. Gone are the strife and petty jealousies of yesterday, and in their place we find great harmony and singleness of purpose; that of improving the profession to betterment of all.

This has not been done all at once as may be readily imagined, but by the concerted efforts of all. There have been many rough passages on this road to reach the common goal, but by perseverance and tolerance it has been achieved. The practical demonstration of this is seen in such things as those new departments of make-up in the studios and, by the end of this current year, we expect to see every studio in this great motion picture profession equipped with such a department as is seen in the Fox, First National, Metro-Goldwyn-Mayer and Paramount-Lasky Studios.

The production cannot exist without the actor and the character and the character actor cannot exist without the make-up artists, for it is he who creates the character you see portrayed before you on the screen. This is most graphically portrayed in such productions as the "King of Kings," "Way of All Flesh," "Helen of Troy," "The Man Who Laughs," "Seventh Heaven," "Trail of '98," and the various Gorilla pictures.

The art of make-up is not confined to the application and handling of cosmetics and hair goods, but it is necessary to make an exhaustive study of periods and types before the stage of application is reached. This necessitates the artists having access to a most complete and authentic library from which he may secure that knowledge which is necessary to him in order that he may authentically reproduce the true character he desires. This entails much extra work with which he is not generally credited.

The Motion Picture Make-Up Artists' Association is comprised of fifty members only. Each applicant must pass a classification committee and prove that he is eligible to be a member. Thus is each member proved to be a qualified make-up artist. Some idea of the support accorded this Association was demonstrated when the Association was four months old; a mardi gras ball was given and scored a great success in every way, being largely attended by all departments of the industry and a handsome financial profit was realized.

The writer cannot conclude this article without making grateful reference to that great artist and father of the Motion Picture Make-Up Artists' Association, Mr. Max Factor, for it was through his generous support that the M. P. M. A. A. was made possible, also not forgetting the motto of this Association:

"Honesty—Integrity—Service."

Growth Draws Lens Concern

The enormous growth of industry in the Los Angeles area has resulted in the establishment here by the Bausch and Lomb Optical Company of a complete salesroom which may ultimately grow into a branch plant, according to R. D. Sangster, manager of the industrial department of the Chamber of Commerce.

The establishment of the company's local salesroom in the California Medical Building, 1401 South Hope street, followed the recent visit to Los Angeles of H. Eisenhart, vice-president of the company, who was so deeply impressed with the growth of this area during the past few years, that he arranged immediately for local representation. Ransom Pratt has been made local manager.

"The great number of industries in this locality, which are carrying on scientific research work, demanded that we carry a complete line of scientific instruments here," stated Mr. Pratt. "In addition to this, educational institutions are becoming a constantly increasing market for our products. Mount Wilson observatory, California Institute of Technology, University of Southern California, University of California at Los Angeles and other institutions including the public schools, are great consumers of our equipment.

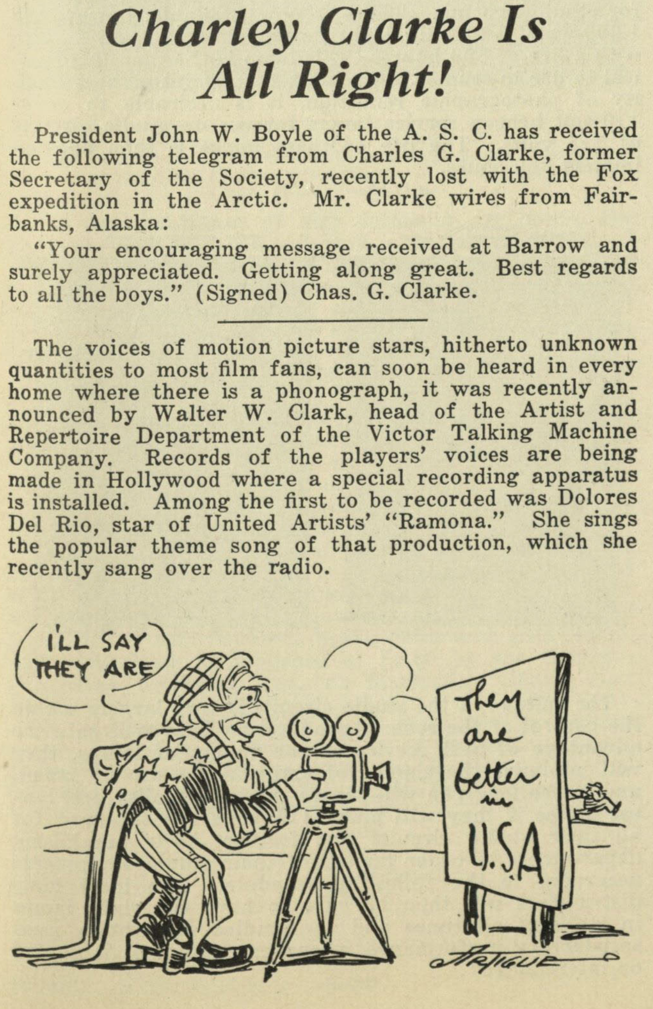
"The motion picture industry as well as a large local photographic industry utilizes all kinds of lens, and the growth of commercial aviation here, where 35 percent of all air activity of the nation is centered, demands in addition to simplified navigation equipment, reflecting mirrors for beacons and other equipment on the fields. Protecting the eyes of industrial workers alone creates a demand for lenses here.

Charley Clarke Is All Right!

President John W. Boyle of the A. S. C. has received the following telegram from Charles G. Clarke, former Secretary of the Society, recently lost with the Fox expedition in the Arctic. Mr. Clarke wires from Fairbanks, Alaska:

"Your encouraging message received at Barrow and surely appreciated. Getting along great. Best regards to all the boys." (Signed) Chas. G. Clarke.

The voices of motion picture stars, hitherto unknown quantities to most film fans, can soon be heard in every home where there is a phonograph, it was recently announced by Walter W. Clark, head of the Artist and Repertoire Department of the Victor Talking Machine Company. Records of the players' voices are being made in Hollywood where a special recording apparatus is installed. Among the first to be recorded was Dolores Del Rio, star of United Artists' "Ramona." She sings the popular theme song of that production, which she recently sang over the radio.



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How to Order Mazda Lamps for Best Results At Lowest Cost

By R. E. Farnham

The advantages of incandescent lighting for motion picture production are now well known. In order that these advantages may be realized at lowest cost for equipment and operation, and that the highest quality of photographic rendition which the panchromatic film has made possible, may be attained, it is important that lamps should be operated at the correct filament temperature.

The 2,000, 5,000, and 10,000-watt lamps used in modelling lighting equipments were designed especially for photographic service, and the best results are realized when these lamps are burned at their labeled voltage.

The lamps used in broadside, over-head, and general lighting units are of the type long standard in other classes of service. It is obviously to the advantage of the producer to utilize standard lamps and thus obtain the benefit of lower price and better service than would otherwise be possible. However, in the other fields for which these standard lamps were designed, a lower filament temperature is used than is demanded for greatest economy and best results in photography.

It has been found that when the lamps are operated at filament temperatures corresponding to a life of approximately 300 hours, the rendition of all colors is most excellent. Fortunately, it is possible to secure this result with standard lamps by ordering them for a lower voltage than that of the circuit on which they will be operated. This higher operating voltage, while shortening the life, increases the amount and actinic value of the light. This means that somewhat fewer equipments and less total wattage are required than when the lamps are operated at a lower temperature or voltage. At the higher filament temperature there is more blue and violet radiation, whereas at lower temperature there is a greater proportion of red.

Fig. 1
OPERATING COSTS
FOR EQUAL PHOTOGRAPHIC LIGHT OUTPUT
OF 1000-WATT PS-52 BULB MAZDA LAMPS OPERATED ON 115-VOLT CIRCUIT

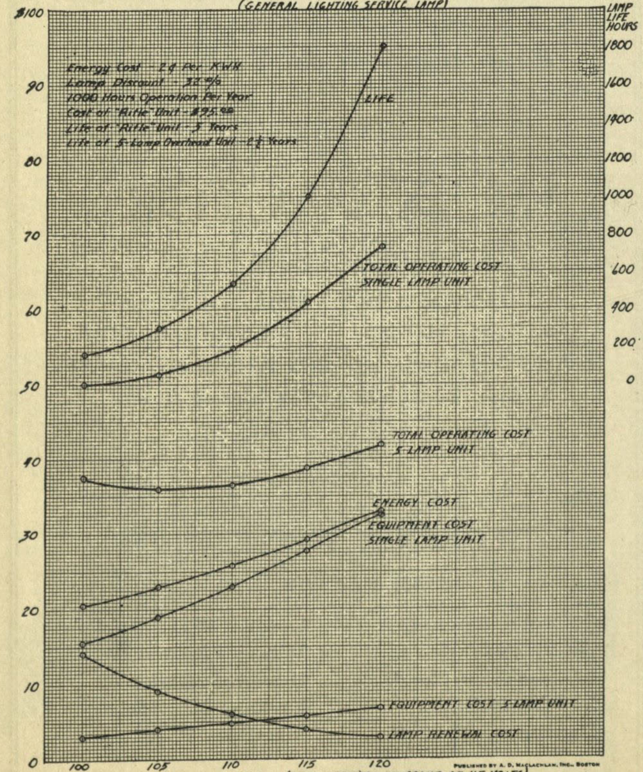


Fig. 1 is an analysis of the total cost for a given constant amount of photographic light from the standard 1,000-watt lamp. The circuit voltage is assumed to be held constant at 115 volts and the curves show how the costs vary when lamps of 105, 110, 115, and 120 volts rating are operated on this circuit.

It will be observed that in addition to the cost of energy and lamp renewals, the fixed charges on both single-light and five-light equipments are added, since the total cost of equipments is going to vary with the amount of photographic light obtained from each one.

It will be observed that at long lamp life the total costs for a given amount of photographic light are higher than at values near 300 hours, at which best results in color rendition are attained. If lamps of a still lower voltage rating were employed, resulting in an extremely short life, the costs would again go up. The data on the basis of which these curves were plotted are indicated on the curve sheet and are understood to be typical values for studios in general. There are certain less definite costs which tend to shift the most economical operation to a still shorter life than indicated in the curves. There is, for example, the factor of breakage caused by the frequent handling. Although this is somewhat variable, the best way to counteract its effect is to get as much light as possible out of the lamps before they are broken. Similarly there is less handling of equipments when each one produces a greater quantity of photographic light.

It is clear that to obtain the advantages of buying standard lamps, 1,000-watt, 1,500-watt, and 2,500-watt PS-52 lamps of 105-volt rating should be ordered when the studio circuit is 115 volts.

The 1,000-watt T-20 bulb projection type of lamp is employed where great compactness is necessary in the lighting equipment. Formerly, this lamp was made only for a life of 50 hours, dictated by the requirements of motion picture projectors. This is not most economical for studio lighting. There is now available, however, a 1,000-watt T-20 bulb lamp designed for beacon service with a life of 500 hours. This lamp is the more economical to use in studios. From the standpoint of best quality of photographic rendition, it is desirable to order 110-volt beacon service lamps for use on studio circuits of 115 volts. The life of these lamps is then approximately 250 hours.

Fig. 2
OPERATING COSTS
FOR EQUAL PHOTOGRAPHIC LIGHT OUTPUT
OF 1000-WATT 500-HOUR T-20-BULB MAZDA LAMPS ON 115-VOLT CIRCUIT

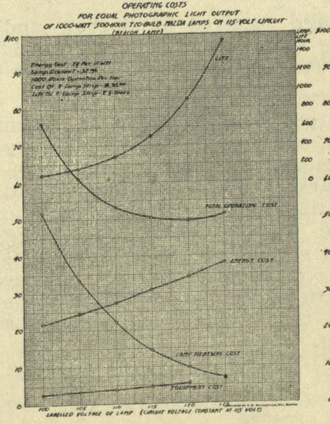
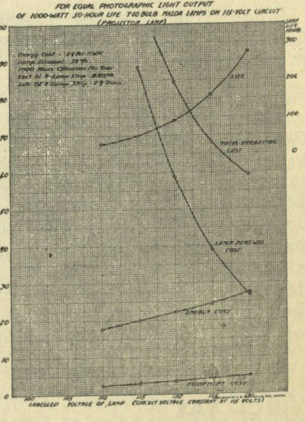


Fig. 3
OPERATING COSTS
FOR EQUAL PHOTOGRAPHIC LIGHT OUTPUT
OF 1000-WATT 50-HOUR LIFE T-20 BULB MAZDA LAMPS ON 115-VOLT CIRCUIT



The voltage of the studio circuits is very largely within the control of the several producers. They will gain the advantage of best service in the supply of lamps, they will minimize the chance of error in the use of lamps, and in the long run will secure the best quality and lowest prices if they will make 115 volts the standard for all their studio circuits and instruct their purchasing departments to order lamps for their studio equipments according to the following schedule. The local lamp distributors will then be sure to have the right lamps in stock at all times and the studios will obtain most satisfactory performance whenever equipment is rented or interchanged.

Cameron's New Book

Talking Movies Fully Described in Motion Picture Projection.

The fourth edition of Cameron's "Motion Picture Projection" has just reached our desk and we find the book to be an Encyclopedia of technical data pertaining to motion pictures.

That this data is timely and up to the minute is borne out by the large amount of space devoted to the new Talking Movie systems. Each of the systems in use today, Vitaphone, Movietone, Phonofilm, Vocofilm, and the new General Electric System, which has, as yet, not been released, are described in detail. The methods employed in the studios for the making of the picture and full clear instructions for the installation and operation of the equipment necessary for the projection of the finished pictures.

When J. R. Cameron, projection engineer and president of the Cameron Publishing Co., visited the Pathe Studio he met Robert Armstrong, Lina Basquette and Fay Garnett, featured players and director, respectively, of "Celebrity," a new Pathe Production.

The various makes of high intensity arc lamps, the high-low lamp and the reflector lamp are all explained in detail as are the new effect projectors and several chapters are given over to Mazda lighting; in fact, it will be a difficult matter to find any technical equipment or motion picture accessory of any importance that is not fully described in the pages of this book.

For the past ten years "Motion Picture Projection" has been looked upon by the motion picture industry as the standard authority on all matters pertaining to motion picture equipment and the technical side of the business. This new edition is, in our estimation, Cameron's best work and by far the best book on the subject published.

The book contains an introduction written by Mr. S. L. Rothafel of the Roxy Theater, New York City.

Some idea of the completeness of the book may be had from the fact that the book contains 1280 pages of text matter and over 500 illustrations and weighs over 3¼ pounds. It has been printed on a good super coated paper and is well bound in heavy cloth with gold stampings. The book is published at $6.00 by the Cameron Publishing Company, Inc., of Manhattan Beach, New York.

We recommend the book to all those who are in any way interested in the technical end of the Motion Picture Industry and especially to those who expect to have contact with any of the new Talking Movie Systems.

Watts	Bulb	Order Lamp Labeled
1,000	PS-52	105 Volts
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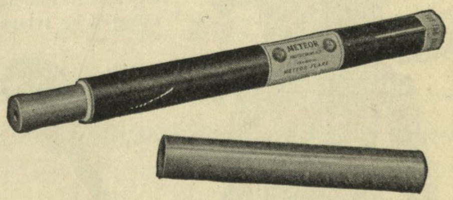

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Regular flares match ignited. Electric igniters can be supplied working on a flashlight battery. Also special electrically fired flares for instantaneous starting of bright light. Multiple ignition and remote control possible.

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All operating mechanisms are in PLAIN SIGHT and AT THE REAR of the instrument. The ease with which the operator may focus WITHOUT DISTURBING THE LENS POSITION, together with the BUILT-IN features all contribute to the SPEED and EFFICIENCY OF OPERATION, so much desired in present-day production.

Some of the EXCLUSIVE features of the MITCHELL are:

(1) Means of focusing without disturbing lens position.
(2) Matte Disc of stock mattes and apertures for 5 filters, built in.
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(5) Rising and Falling Front.
(6) Convenient method of Special Matting.
(7) A positive acting, releasing movement, for normal speed work.
(8) A new Hi-speed movement, with positive registering pins, for ultra-speed—Interchangeable.
(9) Automatic shutter, independent of focusing aperture.
(10) Shutter speeds in two, four or eight feet; automatic and controlled from outside.
(11) Built-in hand dissolve lever.
(12) Turret to accommodate four lenses.
(13) Frictionless light trap for magazines.
(14) Small spool in magazine, and high speed take-up.
(15) Veeder footage counter, built in, for scene lengths.
(16) Single frame counter, in conjunction with Veeder counter.
(17) Dial counter, built in, showing amount of film left in magazine.
(18) Sunshade arm is part of camera, not attached to tripod.
(19) Erect image focus telescope, built in. Two selective magnifications.
(20) Two focusing filters, for regular and panchromatic stock. Built in focus telescope.
(21) Lock-brake while in focusing position, automatically releasing when shifted to photographing position.

War Baby of Cinematography

By Elmer T. Dyer

(Continued from Page 29)

reasons. First, the camera door being hinged from the front of the instrument instead of the bottom, as is usual, with other cameras, allows the operator to secure the camera in a position facing the propeller wash, and while holding the door open with one arm he may easily remove the exposed film and substitute a fresh magazine. Second, the Akeley "Loop" is an integral part of the magazine, and is correctly measured in the dark room. There is no puttering around with the Akeley camera while the operator endeavors to devise an efficient loop. The magazine is simply inserted, the gate closed, and the loop adjustment is assured even in the fiercest gale of the modern airplane propeller.

Recent experimental work carried on in airplane photography by the Akeley specialists of the A. S. C. are proving daily the many merits of this camera for practical work under all flying conditions.

Their progress is proven by the many wonderful air scenes from their cameras that are used in the current classics of air screendom.

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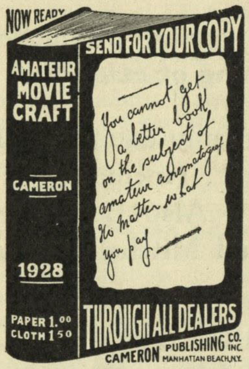
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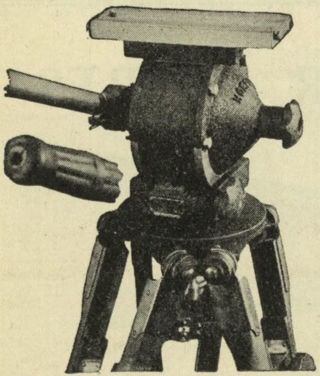

Model B
The Model B is for Bell & Howell and Mitchell Cameras and their respective tripods.
The handle is telescopic and adjustable to any angle.

The Model A is made for Amateur motion picture cameras and also fits the Standard Still tripods.

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Model A

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Albert S. Howell Honored

Albert S. Howell, Chief Engineer of the Bell & Howell Company, was awarded the Wetherill Medal on May 16 by the Franklin Institute in Philadelphia. The Wetherill Award is for outstanding discovery, invention or development in physical science. This distinction was conferred upon Mr. Howell for the development of motion picture cameras and projectors adaptable to the amateur. As Chief Engineer of the Bell & Howell Company, Mr. Howell has been responsible for the designing of the FILMO Cameras and Projector—the work which entitled him to this high award.

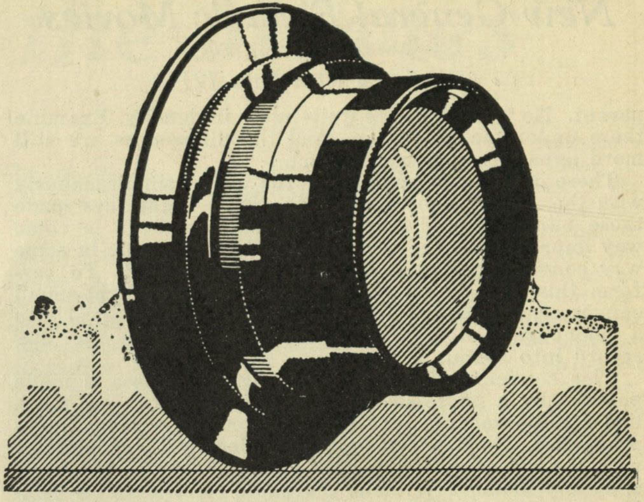
Albert S. Howell, Chief Engineer of the Bell & Howell Company, who was recently awarded a high honor for scientific achievement by The Franklin Institute.

Fifteen other men noted for scientific achievements in widely varying fields were presented with medals by the Franklin Institute in the same ceremony. Henry Ford, "in consideration of his rare inventive ability and power of organization, by means of which he was able to effect high-speed production of automobiles" received the Cresson medal.

Dr. Charles F. Brush, a seventy-nine year old inventor, was awarded a medal for his achievement in inventing the arc light. Others to receive Cresson medals were Charles L. Lawrence for his development of the air-cooled motor, Vladimir Karpetoff of Cornell University for instruments for the mechanical calculation of magnetic instruments and electrical constants of an electrical transmitting line, and Gustaf W. Elmen of the Bell Telephone Laboratories, Inc., for the invention of permalloy, a new alloy 100 times more magnetic than iron.

William E. Taylor received the Potts medal for the development of pyrex, a heat resisting glass. Frank E. Ross of Yerkes Observatory received the Wetherill medal for designing wide angle photographic lenses which increase 100 times the astronomical area that can be photographed.

Albert S. Howell has been active in the Bell & Howell Company since its organization in 1907, and is busy constantly designing new equipment and improving previous equipment for the professional motion picture industry and for the rapidly growing number of those who make their own movies.



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7245 Sycamore Trail GR 9097

New General Electric Movies

By James R. Cameron

(Continued from Page 19)

parent. No two bands are quite alike in density. Examine them under the microscope and the differences are still more apparent—glaring, in fact.

These bands are sound records made simultaneously with the series of pictures on the film. Light rays made these bands. Sound must therefore have been in some way impressed on the rays. Similarly, light must in some way convert the bands back again into sound. To perform this miracle we need a sound-light or light-sound converter, just as we need a needle to dig a record into a phonograph disk and another to translate the dug record into sound.

This conversion of sound into light impulses is made possible by a photo-electric cell, which looks very much like a radio vacuum tube and has some of a radio tube's properties. Such a cell varies in electrical conductivity with the intensity of the light that happens to fall upon it at any instant. Without the photo-electric cell a talking motion picture is inconceivable to an engineer.

In the simplest imaginable talking film we have a lamp or other source of light which forms part of a telephone speaking circuit. We say "hello." The light flickers imperceptibly. Its rays are thrown on a moving film. Each flicker corresponding with a sound element in "hello" is photographed. On the film, after development, a series of parallel bands appear, some darker than others, no two exactly alike. This is a photographic sound record of "hello."

To reproduce this sound record we need the photo-electric cell. Light rays are focused by lenses on the film as it moves. The rays pass more readily through the lighter than through the darker bands. Thus the original flickers are reproduced. After passing through the film the rays fall on a photo-electric cell which forms part of a telephone circuit in which a loudspeaker is included. The cell fluctuates in conductivity with the flickers produced by the bands as the light streams through them. Although the flickers may range from less than one a second to more than ten thousand a second the cell responds instantly. Electric impulses are set up in the telephone circuit, impulses which are now strong, now weak. The diaphragm of the loud-speaker is thus made to vibrate back and forth and to beat the air. Sound waves are generated. We hear the word "hello."

This, in brief, is the fundamental principle of all systems in which sound is recorded photographically on a moving picture film. It is a principle which is almost as old as the motion picture itself. Hardly had the screen play captured the fancy of the world than inventors began to ask themselves: Is the motion picture destined to remain forever a photographic dumb show? Can't these gesticulating men and women be made to talk, sing, laugh and shriek as they seem to be doing? Can't some sort of sound record be made simultaneously with the picture?

For years little progress was made in finding the answer to these questions because there was no satisfactory photoelectric cell. Light sensitive cells of selenium were tried, selenium being markedly affected electrically by light rays. But selenium was too slow. It could not respond hundreds and thousands of times a second to light fluctuations. Then came the war, and with it a wonderful development of vacuum tubes. A way was found of using potassium with a tube to produce a marvelously sensitive photo-electric cell with a response practically instantaneous. With that development the problem of the motion picture was solved. Synchronization of sound and action is merely a matter of engineering ingenuity.

After the photo-electric cell was perfected, inventors of talking motion picture machines blossomed forth as never before. Most of them conceived the idea of incorporating an electric arc or lamp in a speaking circuit and causing the light to fluctuate with the voice in the manner already described; the sound record thus obtained on the film was reproduced with the aid of the cell. Several of these more or less identical methods of causing a light to fluctuate are highly successful.

Doctor Hoxie, of the General Electric Company, proceeded along a different and more difficult path. His light is not incorporated in the telephone circuit at all. It glows constantly outside the circuit. Its beams fall upon a mirror which is directly connected with the sound-collector. Thus, in the pallophotophone, which is one form of sound-collector devised by Hoxie, the mirror literally forms part of the telephone diaphragm, since the two are physically connected. Hence, as the diaphragm moves in response to the voice the mirror must also move. If the diaphragm vibrates 5,000 times a second in response to the high, shrill note of a piccolo the mirror rocks 5,000 times a second. The beams from the constantly glowing light focused on the mirror by a lens are reflected on the film through a slot one one-thousandth of an inch wide and one-tenth of an inch long. Hence the sound record appears as a series of slot-shaped bands.

In the projection machine a similar mirror catches the rays as they travel from a small lamp through the film and throws them on a photo-electric cell, by which, as we have seen, they are converted into telephone currents made audible by a loud speaker to a whole auditorium.

(To be continued in August)

The New Model "L" Parvo-Debrie

As an indication of the rapid strides being made by inventive genius in the field of professional motion picture apparatus, the new Model "L" Parvo-Debrie offers a unique example.

Nowadays, when the requirements for filming great feature pictures are so exacting—when such extraordinary care must be employed to secure certain effects, it is a source of great satisfaction to both cameraman and director to know that practically every method of securing any known photographic effect has been anticipated in the construction of the new Model "L"—in time-saving features, exclusive with the apparatus.

By far, the outstanding feature of the Model "L" is its full size ground glass focussing device. By simply moving displacement apparatus on the top to the right, the film gate slides to the right, taking the film with it, and the ground glass comes into position at the aperture. The crank movement automatically locks, and direct focussing may be done on the ground glass. The image is shown right side up, full size of aperture, and magnified nine times to assure accuracy of detail. Here is an extremely valuable feature—either when changing to lenses of different foci or when employing the same lens for various distances.

The new Model "L" also possesses other distinctive features—each conceived with a view of simplifying the work of taking professional motion pictures. Some of these are: Pilot register pins, assuring that constant steadiness of film travel, as well as perfect arrest when super-imposition work is required; both automatic and hand dissolve; releasing pressure plate—to avoid static and film scratches; provision for instant attachment of electric motor; every operation on the New Model "L" is both visible and controllable from the back.

Here, indeed is a camera de luxe for the professional operator whose work is exacting and who desires an apparatus in which is incorporated everything which could possibly be required for professional pictures. This camera is on demonstration at Willoughby's, 110 West 32rd Street, New York.

J. E. Brulatour, of J. E. Brulatour, Inc., West Coast Agents for Eastman raw film, has gone to Europe for a two months' sojourn, combining business with pleasure.

COOPER HEWITT LIGHTS
Keese Engineering Co.
Hollywood—7380 Santa Monica Blvd.
San Francisco—77 O'Farrell Street

"Stills Move the Movies"

By Fred Archer, *A. S. C.*

The still picture plays a very important part in the Motion Picture Industry, although, with the exception of a few who come into daily contact with it, its importance and its uses are but slightly known. To be sure, one says, almost immediately, "Why of course they are used to advertise the picture." This is correct—but there are equally important minor roles to be played by the still pictures before they are used for advertising purposes.

The main objectives of the still picture may be classified as follows: Advertising the Production; Marketing the Production; Production reference work and Trick Photography. It is in the latter three uses where the value of the still picture is but little known.

In the advertising field the still picture is used to illustrate and help plant the articles broadcast by the publicity department throughout the periodical world and it is used for lobby displays. In this field the necessity for good stills can be seen. The public of today is an apt pupil of the arts and its minds keeps pace with the ever growing artistry of the world. A good still will attract and hold attention where many poor ones will receive but a passing glance.

Photography has striven for years to gain acceptance among the arts and the struggle has been long and hard. It is only in the last few years that photography has been raised from pure mechanics and given its well deserved place with the other arts. This is especially true of that branch of photography known as the motion picture and as it soars ever upward in its merits so must the still picture hold its own place on the same par, as it is through the still picture that our public is invited into our theatres to view the motion picture. This public, we must not forget, makes motion pictures possible by supporting the industry. It is therefore very important that we have good still pictures to invite the public to come into our theatres and view our motion picture productions.

In order to have a motion picture in a theatre for the public to view, it is necessary to sell that production to the theatre. There has long been a saying that "The Stills Move the Movies." This is very true for many theatre managers, especially in these hurried times, have not time to view every picture produced in order to choose his program and the portfolio of stills carried by the salesmen from the exchanges, telling quickly the story and quality of the movie is an essential need of the sales force. As this portfolio is to tell the story and show the quality of the movie, it is very important that we have good still pictures to show to the theatre managers.

In order to have a good production for these salesmen to sell to these managers it is necessary to make this good production. In this work the still picture is again invaluable. Even before a production starts there is a great deal of preliminary still photographic work to be done. Pictures gleaned from many sources, by the research department, showing costumes, buildings, properties and characters must be copied for the various allied artisans of the studio to refer to for their various needs.

Many times while filming a set it is necessary to photograph it with the still camera in order to redress it exactly the same for retakes. Special make-ups must be photographed in order that they are the same day by day. The art department uses photographs of sets in order to use these sets for other pictures, planning from these stills the rebuilding or redecorating of these sets.

Cinematographers often have stills shot and rushed through the laboratory in order to get a confirmation of lightings, color values and other details before shooting a scene. It is very important in this instance that the stills record just what the motion picture camera is to record. In these latter uses the stills save much time and are an invaluable asset to the production.

During the filming of one of the recent sea pictures it was necessary to film medium shots of a boat on the rocks being torn to pieces by the waves. This set was built in detail and hundreds of men were employed to work the various mechanisms used to truly portray this scene. A terrific expense went on hour by hour. The wreck was photographed in progression, each step requiring concentration and thought by all concerned. The daily rushes the progression in their minds the director and cinematographer had the still man shoot each progression as each scene was filmed. These stills were printed and delivered on the set twenty minutes after being shot and were used to study out the subsequent progression. In this case these stills were invaluable as a great deal of time and argument was saved, also a perfect progression could be figured step by step from concrete evidence of what had been shot.

Still pictures also play an important part in trick photography, helping the trick man with double exposures of clouds, scenery and many other helpful ways. In art title work still picture backgrounds are unexcelled. It is therefore very necessary that we have good stills from a production angle.

Good stills there are necessary from many angles.

The publicity department knows the value of good stills but usually to the production department a still is a still and an added expense that has to be tolerated. This is unfortunate as most still men work under this department. Of course the stills are a production item and must be carried as a production expense, but I firmly believe that the supervision of the still man should be up to the director of publicity.

There are still men and still men. That is, there are still men who are good photographers and artists, understanding composition, grouping, lightings, etc. We know that the cinematographer lights his set for the action but oftimes when the action is stopped and frozen solid in a still there is no composition and there is poor lighting, while in the motion picture action the continual motion of the figure carries perfectly. A good still man is capable of moving people and lights to get the desired effect. Then there are still men who are bulb squeezers and nothing else. The first kind furnish stills that will attract, the latter furnish just stills. The first find favor with the publicity men. The latter with the production department; they work cheaper. I do not say these men are not worth what they get, but I do say they are not worth more and a man who is not worth more than he is getting is a poor investment for any business.

I know of a case where a studio is relying on men who are new to motion picture work and who will work cheap to break in (and there are plenty of them). After they work one or two pictures they ask for a raise and are let go; another man seeking experience takes the place. The production department is saving a few dollars in advertising value. An editor of a large circulating roto-section devoted to the motion picture recently told me that the art supplied to him is so poor he cannot use a full page picture. He wants full page pictures and a full page picture in advertising value could be counted in thousands, but a few dollars is saved and——.

Fortunately there are a few producers who realize the value of stills and good still men. They are the banner carriers, the pioneers and mark my word, they will not lose. They will win out and others will follow suit. It is up to the still men to study and to progress, for the ones who do not keep pace will surely fall by the wayside.

There is one thing sure and that is: The motion picture is coming to an economic basis and the producer wants value received. He is not going to waste money lavishly on anyone but he is going to pay good for good stuff—but it must be good. The man who wishes to make good must study and progress.

What's Ahead?

By Dr. Kenneth Hickman

(Continued from Page 11)

the time is going to come in the near future when the film lending libraries will be a standard part of our home entertainment existence.

I don't want to talk platitudes to you, but as people primarily connected with the advertising business you know you cannot take 35mm. advertising film and insert it in the ordinary theatre program, because when people who pay to go to the theatre don't get what they call legitimate entertainment they are going to get wild at being forced to look at your stuff, and your laboriously made film is going to create a bad impression. The consequence is you are bound to put your advertising film on the same basis as a large magazine advertisement, place it before the public to take or leave. I am going to suggest that the library is going to form a wonderful means of distributing visual advertisement by 16mm. film for voluntary consumption.

Let's go back a little bit. Pictures made on the smaller film professionally are largely reductions from 35mm. of things done on a large scale. You have the very best photographers in the world in Hollywood. They are setting a very difficult standard which will have to be lived up to in the 16mm. work. Whether you use 16mm. or 35mm. your work is going to be up against that of men with almost unlimited resources. You people are up against limitations all through and therefore you have got to pay the greatest possible attention to quality.

Our talk cannot finish without mentioning another, less obvious kind of advertising. It is the sort there should be between one part of photographic manufacture and another. As each year there are improvements in technique and means of attaining extra quality, each year each part of this cascade system of production has got to go to the other parts and say: "Boys, we have a new idea for you, a new method of doing things. We want you to know about it and use it." Each part of the photographic industry has got to advertise itself to the next part, and that is a very difficult thing to do. We must realize that not only has the trade photographer doing advertising work got to pay attention to actual tonal quality, he has got to be wise to the very latest in Stunt photography. There is no fake or wheeze done for entertainment on the Coast which you gentlemen have not got to imitate and perfect, if possible, in your advertising work.

Some little time ago the Eastman Kodak Company had a length of film to develop from an African explorer, and when this film was sent back to the explorer and he was asked how he liked it, he said it was just fine, but somehow or other it did not look really like the jungle. The answer given him was that he hadn't used Panchromatic film and had therefore got no skies in the pictures. If he wanted it at additional expense we could print in some skies. He wrote back and said: "That's great, print in the skies, and when you come to that shot where I am shooting lions, see if you can't remove the row of bushes between me and the lion."

That is the position you gentlemen are in; manufacturers are going to ask you to remove rows of bushes which stand between the appearance of their products and the general public, and you have got to be able to do it. How are you going to learn? Only by free interchange of ideas.

"Technique of the Talkies"

THE AMERICAN CINEMATOGRAPHER is pleased to announce "Technique of the Talkies," by Mr. Lewis W. Physioc, to appear in the August issue of this magazine. Mr. Physioc's article in this, July issue, will be found of intense interest by all of those readers in any way concerned about the sound pictures and his follow-up in August will be of even greater value and interest.

Telephone, Hempstead 8191

MOLE-RICHARDSON, INC.
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But in their efforts to duplicate the original, they neglect to duplicate the skill and artistry which gives it distinction.

They succeed only in imitating the lesser details, the shell and semblance of the reality; they never attain to its deep, inner excellence.

They are barred from reaching this goal by the natural law that the follower can never be the leader; that he who is content to tread in the leader's footsteps can never by any chance overtake him.

There can be only one best in every field, and, in the field of lighting equipment for motion pictures, the product of Mole-Richardson, Inc., has won that title.

This is proved not only by the enthusiastic reception accorded the Mole-Richardson electrical equipment in the Hollywood Studios, but by orders arriving daily from almost every producing center in the world.

Let us take occasion to thank the members of the A. S. C. for their many suggestions and constructive criticisms, which have greatly assisted us in the development of our Incandescent Lighting Equipment. We assure you that Mole-Richardson Equipment will not only maintain its standard of excellence, but will be improved as the art of the industry progresses.

Cordially,
MOLE-RICHARDSON, INC.
PM:AS By Peter Mole.

New Light on Talkies

By J. C. Kroesen

(Continued from Page 8)

ground for the actor—it creates a setting to assist him to successfully portray his part—can you imagine an actor playing "Hamlet" with no stage setting at all.

Motion picture theatres do not have these settings, if they do they are but visible when the picture is not being projected or may be a part of the picture itself, all located within a small area, black and white, with possibly a tint in the base of the film—no other color, which in itself alone will not meet the requirements entirely, for a complete setting as the spoken stage may have as a setting to the actor. The optienence therefore will focus their entire attention on one thing—a purely black and white picture projected through a color medium base.

The optienence, therefore, views the talking picture with a very critical eye, viewing only that point of action from which the sound should come and registering that which they hear with that which they see.

The silent drama or pantomime, is always in synchrony, therefore the talking picture to be successful must be in direct synchrony both voice and sound from the point at which the observer is located.

In a large theatre this is impossible, but by the use of a universal starting point, and apparatus sufficiently flexible to permit proper adjustment, this may be accomplished to such a degree that only the critical eye will detect the error.

Sound reproduced at a high intensity is not always desirable; why amplify the undesirable noises which are possibly due to slight imperfections in apparatus which our scientific corps have not been able to eliminate? Some day there will be a remedy, until such time my suggestion is to amplify only to normal speech and use the secondary methods. Why dampen the desire of the theatre-goer? Why not create a desire for talking movies?

Our engineers may say that this is a more expensive method, and not as efficient method as that which they now propose to use. I admit they are correct in both. The public have been fooled long enough. Do not experiment, the apparatus we have now is, if properly applied, quite sufficient to produce results and too much money is involved in equipment.

Recently I had the opportunity of seeing a picture projected where the sound reproducing apparatus was a part of the screen, and would fly with the screen; it was truly wonderful, the switching arrangement placed the orchestra where it belonged (in the pit) and the voice on the screen, two sound records were on the film, each amplified at its proper intensity.

Those manufacturing and reproducing talking pictures must now make good. Too rapid a progress, without good tone reproduction, spells disaster. Talking pictures, from my view will never replace the silent drama entire—the silent drama is the universal language.

Talking pictures have an exceptionally big field in education if the cost of production can be reduced—weeklies, news reels, effects for the silent drama, prologues for the small neighbor theatres, music to accompany pictures for the small theatre. Photographic sound records may be devised to permit two to three hours' show; this, of course, is not possible with the phonograph record without changing; the photographic sound record may be recorded in helical form on a film with records adjacent to each other.

Talking or sound reproducing films should find a fertile field if handled and merchandised properly—the exhibitor should demand talking pictures to complete his daily program.

James R. Cameron, President of James R. Cameron Inc., publishers, of Manhattan Beach, New York, has been sojourning in Hollywood during the past two weeks and is now enroute home via the Houston convention. Mr. Cameron is the author of "Electricity for the Operator," "Motors and Motor Generators," "Amateur Movie Craft," "Talking Movies," "Motion Picture Projection," etc. Mr. Cameron is one of the most useful men in the motion picture industry and his books are authoritative.

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Class Room Films

An Experiment in Their Development From Scenario to Screen --- A Plan to Test Their Value

[Abridgement of an address delivered by Dr. Thos. E. Finegan, Education Director of the Teaching Film Department, Eastman Kodak Co., before the Society of Motion Picture Engineers, Lake Placid, N. Y., September 28, 1927.—Editor's Note.]

The production of a type of film suitable for classroom use is purely an educational or professional problem. The cost of producing the necessary equipment and the cost of making and distributing films is purely an economic or business question. The training of teachers to use and to appreciate the value of films is a simple question of good school administration.

The general use, therefore, of classroom films resolves itself into the solution of these questions. Is it possible to produce the character of films which will yield measurable results in classroom work of sufficient value to make their use a profitable investment? If such films can be produced and this result can be achieved, is it possible to produce them at a cost which will make it practical and feasible for the schools to provide them? May teachers be trained to use motion picture apparatus and to evaluate film service?

It may not be expected that motion pictures will be given popular recognition as a teaching agency by educational authorities until sufficient reliable data upon these vital questions are made available. A few experiments in this field have been conducted in this country and in Europe but the extent and the general scope of such experiments have been wholly in the results recorded and in making available to the public material upon which a basis for the determination of these questions may be reached.

The experiment under consideration was not entered upon in the belief that it would afford all the information desirable in the development of a sound program of visual instruction through the use of motion pictures. It was undertaken in the belief that it would reveal the essential fundamental knowledge for the solution of the chief questions which we have stated are the basis of the development of such program.

A brief statement of the movement which lead to the experiment will give a better understanding of its purpose. In 1922 the National Education Association created a committee on Visual Education to develop plans which would extend the use of visual aids in the schools. This committee established cooperative relations with the Motion Picture Producers and Distributors of America, Inc. The purpose of the committee was brought to the attention of the Eastman Kodak Company.

In March, 1926, Mr. George Eastman announced that the Eastman Kodak Company had made a survey which showed in substance that little had been accomplished in the production of suitable films for classroom service; that there appeared little prospect that an organization with sufficient resources would enter upon a program to produce films of this type on an adequate scale; that motion pictures for this specific purpose were not practicable until an easily operated projector and economical films were available, but that he believed projectors on the market and the narrow width films would afford a solution of the economic aspects of this problem.

This announcement further stated that in view of these conditions, and after full deliberation, the Eastman Kodak Company had decided to approach the solution of this problem by an experimental method; that under the advice and cooperation of leading teachers the company would produce a number of class-room films closely correlated with selected courses of study and in accordance with a definite educational plan; that provision would be made to give these films adequate trial in classroom practice to determine their value for such use; and that through the results achieved it should be possible to reach sound conclusions on the effectiveness of films as a class room aid, and also to ascertain the probability of producing such films at a cost which would make them available for popular classroom service.

Following this announcement Mr. Eastman invited several leading teachers and school administrators from various parts of the country to Rochester for a conference at which he presented the general plan of the proposed experiment. The conference gave cordial approval to the plan. It also expressed an unanimous opinion that in the experimental stages of working out a program it was essential to concentrate upon the most vital subjects of the fourth, fifth, and sixth grades and the junior high school.

The general features of the proposed experiment were included in the Report of the Committee on Visual Education of the National Education Association at its annual meeting in June, 1926, and the general assembly of that body by unanimous vote expressed the opinion that an experiment of this character would render invaluable service to the educational interests of the nation and recommended that teachers and school officers throughout the country extend every possible assistance and cooperation in this experiment.

The experiment described in this paper, therefore, is the one now being conducted by the Eastman Kodak Company in cooperation with the schools of several cities of the country in the development and use of classroom films. The work of organizing the material and the planning of the experiment began in September, 1926.

There were certain lines of procedure in relation to motion pictures and to school room practice which had to be cleared up before entering upon the real work of this experiment. For instance, in dealing with subjects intended to develop correct attitudes and habits in life on the part of children, as in courses relating to health, we have followed the procedure of basing films on the positive or constructive practices which show the benefits derived from pursuing such courses, instead of basing the films on the negative or improper practices and the penalties resulting therefrom.

There are also certain scenes entirely proper from the ethical viewpoint which would shock or intimidate children of sensitive nervous systems. Therefore, all scenes which might produce undesirable mental reactions on the part of children have been avoided in preparing Eastman Classroom Films; as for instance, a scene in the film on cattle which shows the branding process, scenes containing repulsive practices, etc.

Motion pictures have been so universally used since their beginning as a means of entertainment that in the great majority of attempts to adapt them to the use of the school the entertainment idea has been carried over in them. The story and the drama are factors of great power in educational processes and especially with children of the lower grades. Where this form of instruction is resorted to, it should be presented by the masters in story telling and in the dramatic field. But all the work of the schools should not be administered upon entertainment or dramatic lines.

Films should not be made primarily to entertain children or to exert a dramatic power over them. They should be made with the intent to present accurate viewpoints and pictures of actual conditions representative of our social and economic life. The dominant tone and spirit of the film should be to present ideas, to reveal processes, to clarify situations, to represent actualities—to instruct.

Motion pictures should be what the term implies, and that is pictures which represent motion or action.

(To Be Concluded in August)

Fox Case Movietone

By Earle I. Sponable

(Continued from Page 25)

number of horns so located that even distribution is obtained in a theatre. The horn type loud speaker has a distinct advantage over the cone type, in that it is somewhat directional and with it the acoustical aberration in a theatre may be corrected. A horn distributing panel is used to permit a variable number of horns to be utilized, and the volume from each individual horn to be controlled. Theatrical acoustics are of such complex nature that each individual layout must be considered in making an installation. For the smaller theater where there is not room for a horn installation, a disc type of speaker has been developed.

It has been found that the regular projectionists in the theatre are capable of maintaining and operating the Public Address systems. A periodical inspection service and a regular routine of Movietone operation is prescribed which insures against loss of program due to nonfunctioning or the failure to properly operate the equipment. Development is being made along the lines of reducing all possible error in the handling of the equipment by the installation of such improvements as the optical slit, battery eliminators, centralized control, automatic volume regulation, etc.

Uses

The production and uses of the Movietone are now being developed along a number of different and varied lines. These include real pictures of the same type as the silent picture but with sound. These pictures will use the real sounds of life with possibly music inserted where the action calls for it.

Musical numbers where the music is specially composed, as well as the story, form a new kind of picture created by Movietone. Short numbers recording the stars of the stage are made for showing in the smaller cities and towns where the stars themselves never appear in person.

Educational, historical, and religious pictures are being developed. These will speed up and improve our present methods of teaching, incidently bringing the personalities and teachings of the great within the reach of people instead of the present few.

Musical scores for the silent pictures can be applied after the silent picture has been finished. These are directed and played by the finest musicians obtainable. Special effects are incorporated that greatly enhance the presentation of the pictures, especially in the smaller theatres.

The news reel is being made more interesting and valuable through the addition of sound. In the case of one recent event, the Movietone recording taken and used totalled 1,566 feet. On the same shot the usable silent footage was slightly over 100 feet. The sound picture in this instance is still being exhibited.

Other uses of this system are evident and will follow. The home use will develop into an important field. Sound pictures of our children, families, mothers and fathers are especially desirable.

The preliminary development of the Movietone system was done at the Case Research Laboratory. It was there, during a period when "talking pictures" were considered more or less of a folly, that Mr. Theodore W. Case financed and through inventive genius, was instrumental in making the system practical. Later, in the face of many complexities, Mr. William Fox undertook its commercialization, and now through the affiliation and cooperation of the Western Electric Company, this system of sound motion pictures seems destined to a field of public usefulness.

Errata

In Mr. R. E. Farnham's article on incandescent lights which appeared in the June issue of THE AMERICAN CINEMATOGRAPHER, at the bottom of page 38, four lamps were mentioned as being available with the mogul prefocused base. We are informed that only the **1000 Watt 115 Volt T 20 Bulb** and the **2000 Watt 115 volt G 48** bulb lamps enter in this category.

Also the **1000 and 2500 Watt P. S. 52 bulb lamps** should show a light center length of **9½ inches** intead of 9 inches as it appears in the table.

TECHNICAL EDITOR.

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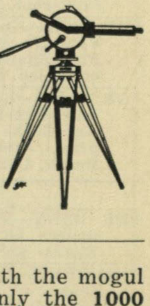

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WANTED—MOTION PICTURE CAMERAS

WANTED, CAMERA—Will buy Bell & Howell camera. State price and equipment. John P. Whalen. Gl. 1101 or A. S. C. GR. 4274.

WANTED—For cash, DeBrie, Pathe, Bell & Howell Standard cameras. Send full description. Bass Camera Company, 179 West Madison Street, Chicago.

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FOR SALE—8x10 Corona Camera, Wollensack 8x10 12-inch F.4.5 lens, 6 plate holders and tripod, $90.00. Also 2¼x3¼ Grafles, Bausch & Lamb F.4.5 lens, $40.00. $125.00 if sold together. To be inspected at A. S. C. office. GRanite 4274.

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FOR QUICK SALE—New Bell-Howell (No. 788) camera; 3 F 2.5 lenses, Universal finder system quick-clamp tripod, 4 magazines, iris sunshade filter holder, used 5 months. Priced right. Ray Bell Films, 817 University Ave., St. Paul, Minn.

FOR SALE—Bell & Howell, excellent mechanical condition; six magazines; three cases. Brand new Astro F 2.3-50 mm Goerz 75 and 40 mm B. & H. tripod with Mitchell legs. Large single arm iris with B. & H. shade box, 4-way matt box, Gauze matt holder and two inch glass filter holder. $1,375 cash. Vernon Walker, 601 W. Fairmount St., Glendale, Cal., or A.S.C. offices.

FOR SALE—Cash only. $1,250.00 Bell & Howell Camera, No. 490.00 Astro lenses, fully equipped. Perfect mechanical condition and late model B. &. H. tripod. Edgar Lyons, 593-160—4377 Camera Ave., Hollywood.

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FOR SALE—Four slightly used Mitchell Matt boxes at $40.00 per set. Call Chas. Glouner at Universal Studios. HEmpstead 3131.

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FOR SALE—Bell & Howell, excellent mechanical condition; six magazines; three cases. Brand new Astro F 2.3-50 mm. Goerz 75 and 40 mm. B. & H. tripod with Mitchell legs. Large single arm iris with B. & H. shade box 4-way matt box. Gauze matt holder and two inch glass filter holder. $1,375.00 cash. Vernon Walker, 601 W. Fairmount St., Glendale, Calif., or A.S.C. offices.

FOR SALE, CAMERAS—B. & H. Camera No. 576 with 50 mm. B. & L. F.2.7 40 mm. Goerz Hypar F.3.5 and 75 mm. Zeiss Tessar F.3.5. Mitchell Tripod, 6 magazines, Universal big finder, brand new Matt box and countless other things for sale. Call John Stumar or Chas. Glouner at Universal Studios. HEmpstead 3131.

FOR QUICK SALE—New Bell & Howell (No. 788) camera; 3 F 2.5 lenses Universal finder system quick-clamp tripod; 4 magazines iris sunshade filter holder used 5 months. Priced right. Ray Bell Films, 817 University Ave., St. Paul, Minn.

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FOR RENT—Bell & Howell, complete. Fast lenses, magnified finder, Mitchell tripod and Tilthead prism or Goerz upright eyepiece. R. DeGrasse, 595-533. 4312 Ambrose Ave., Hollywood.

FOR RENT—Three Bell & Howell 170 Degree Cameras, F. 2.3 and F. 2.5 lenses, Mitchell Tripod legs. Complete equipment. Eddie Linden, 6017 Elinor Ave., Hollywood, HEmpstead 8333 or A. S. C. office, GR 4274, GR 4704.

FOR RENT—Camera equipment: 1 Mitchell Camera, 1 Mitchell Speed Camera with attachment, new. 1 Bell & Howell, 1 Akeley (Full Equipment). Ted Tettzlaff, Phone GR 9255. 1724 N. Western Ave., Hollywood.

FOR RENT—Complete Mitchell outfit, with Astro Lenses—Phone Mitchell Camera Co., HO-3496 for equipment of John Silver, A. S. C.

FOR RENT—Bell & Howell 170 degree 1⅝, 2, 3 and 6 inch F.3.5. lenses. Light Tripod. Complete Studio equipment. Rent reasonable to responsible party. Phone Smith, MEtropolitan 7038.

FOR RENT—Four Bell & Howell Cameras, one cinemotor and friction head for Bell & Howell; 2.3 Astro lens, large Prismatic Mitchell finders and Mitchell legs. Special built-in side Prisms. Baby tripod, extra tripod; six inch lens in mount. Richter Photo Service, 7764 Santa Monica Blvd., GL-7804; at night HE-1780, or B. B. Ray, 591-331.

FOR RENT—MISCELLANEOUS

FOR RENT—One Cinemotor with Veeder counter in first class condition. Baby tripod; extra tripod. Mitchell friction heads for Bell & Howell camera. Six inch lens in mount. Richter Photo Service, 7764 Santa Monica Blvd., GL-7804; at night, HE-1780.

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FOR RENT—Complete Mitchell outfit with astro lenses, six magazines, by Al Gilks, HE 1490.

FOR RENT—To reliable party, one Bell & Howell camera with Mitchell legs; Astro Lens F. 2.3., Fl. 8. 6 magazines. Fred Hoefner mat box. In perfect shape and fully equipped. Joe LaShelle. ORegon 6730.

FOR RENT—CAMERAS, ALL KINDS. Akeley, Bell & Howell 170%, also Speed DeVry Graflex, Still (late model Anscos). For rent by day or week to responsible parties. Ries Bros., Ries Bldg., 1152 No. Western Ave. Phone GRanite 1185; Residence, HO-1055.

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ONE DE VRY Motion Picture Camera. Complete outfit. Alvin Wyckoff, Phone Care A. S. C., GRanite 4274.

BELL & HOWELL. Victor Milner, 2221 Observatory Ave., Los Angeles, California. 596-944.

BELL & HOWELL—Phone Perry Evans, OL 8797 or Hollywood A. S. C.

BELL & HOWELL, 170, with 30, 40, 50 and 75 lens equipment. Baby tripod. Also B. & H. Cine motor. Charles Stumar. GRanite 9845. 7501 Lexington Ave., Hollywood.

FOR RENT—STILL CAMERAS

FOR RENT 1 8x10 Still Camera, focal plane shutter, complete, 1 Mitchell Friction Tripod, new, for B. & H. 1 Eyemo Camera with special lock. 1 4x5 Graflex B. & L. lens. 1 B.-H. Low Boy to fit new style B.-H. Tripod head. Joe LaShelle, 639 N. Sierra Bonita, ORegon 6730.

FOR SALE—LENSES

FOR SALE—4 inch F 2.7 Carl Zeiss Lens. Brand New. Make an offer. Ray L. Ramsey. GLadstone 2466.

FOR SALE, LENSES—Carl Zeiss, F. 3.5, 50 mm., mounted in latest B. & H. mount. Looks like new. Perry Evans, 413 No. Mariposa Ave., Hollywood, California.

FOR SALE—50 m.m. Goerz Hyper lens F. 3.5 in B. & H. mount, $25. 50 m.m. B. & L. lens F. 2.7 in B. & H. mount, $45. J. N. Giridlian, Phone TErrace 9152.

ONE two-inch Bausch & Lomb F.2:7; one Dahlmeyer Pentac 37 mm. F.2:9. Georges Benoit, care of American Society of Cinematographers, Hollywood, California.

WANTED—MISCELLANEOUS

FOR RENT, LENSES—Trick lenses of all descriptions for rent by day or week. Call George Meehan, A. S. C. Phone GR 3830, 744 North Curson Ave., Hollywood, California.

WANTED—Will buy Bell & Howell cinemotor and a 32 M. M. Lense. Call Herman Schopp, HOlly 4735 or care A. S. C. office, GR. 4274.

WANTED—Akeley, any condition, for experimental work. Wire W.U. night letter giving camera number, equipment, condition and lowest price. Cawthon, McMinnville, Tenn.

WANTED—Bell-Howell Cinemotor and Veeder counter for use with same. Have for sale Carl Zeiss lens 50mm. F.3.5 in Bell-Howell Mount. $40.00. Alfa Film Laboratories, 3437 Park Heights Ave., Baltimore, Md.

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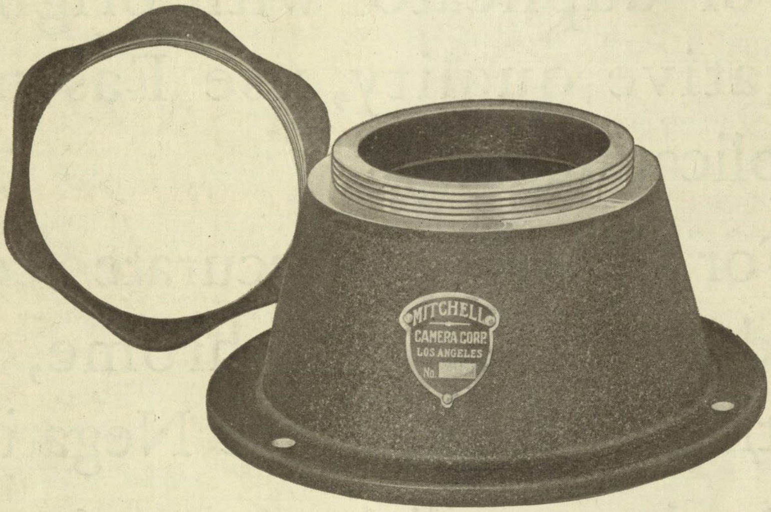

Tilthead Adaptor

This device is provided to be used in place of a tripod in instances where the camera must be placed very low, or near the ground, especially in cases where animals are being photographed. Screw holes in the outer flange are provided for securing where desired.

Another type, not illustrated here, is made which stands about eight inches from the floor, having three legs attached and made to use with our regular quick release unit from our standard tripod. This is especially adapted to use with our Friction Tilthead, because this head will not fit on the regular threaded top of the low adaptor. A threaded protector ring is furnished with each adaptor of the low type, which prevents the threaded top from becoming damaged.

Mitchell Camera Corporation

6011-6025 Santa Monica Blvd. **Hollywood, California**